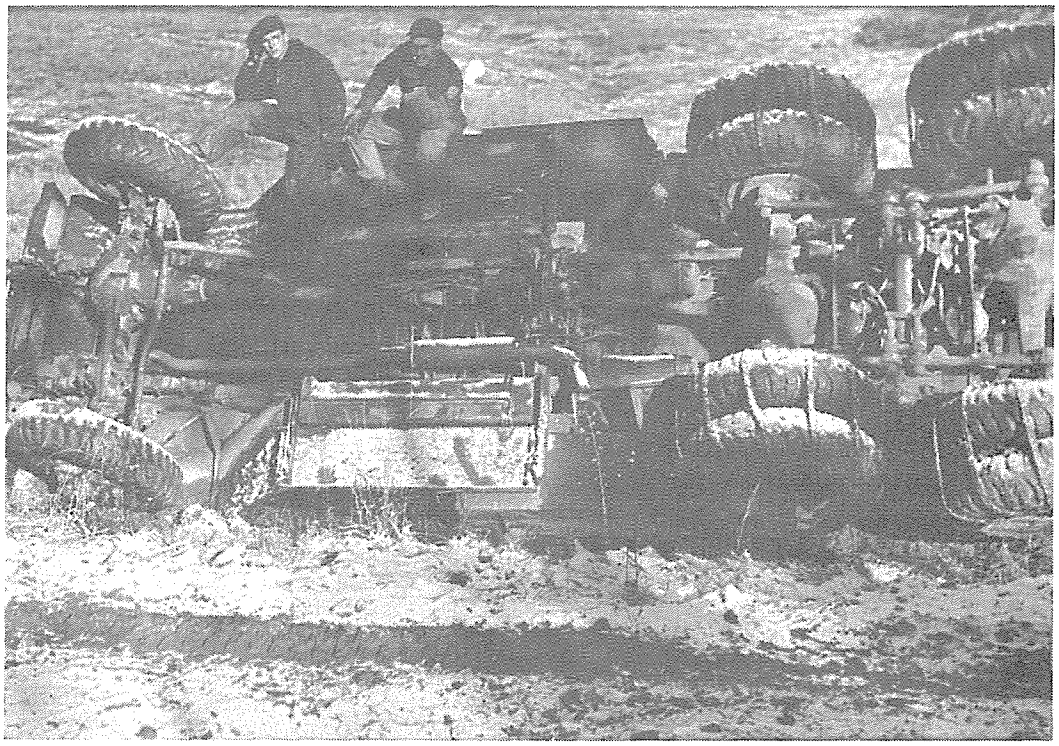
TECHNICAL BULLETIN



KEEP IT ON THE ROAD - NOT IN THE SHOP

VOLUME 15 NUMBER 1

MAR 70

TECHNICAL BULLETIN

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THIS TECHNICAL BULLETIN IS PUBLISHED TO ASSIST MAINTENANCE PERSONNEL IN KEEPING INFORMED OF CURRENT TRENDS IN DEVELOPMENTS, TO CIRCULATE NEWS OF THE MAINTENANCE ORGANIZATION AND INDIVIDUAL ACTIVITIES, AND ALSO TO PROVIDE A FORUM FOR DISCUSSION AND THE EXCHANGE OF IDEAS BY MEMBERS OF THE MAINTENANCE ORGANIZATION.

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FORWARD YOUR ARTICLES AND IDEAS TO

THE EDITOR
TECHNICAL BULLETIN
THE CANADIAN FORCES SCHOOL OF COMMUNICATIONS AND LAND ORDNANCE ENGINEERING
VIMY BARRACKS
KINGSTON, ONT

CONTENTS

EDITORIAL 2

THE DEVIL IS A MAINTAINER 3
(A look at what the DEVIL Program is doing in the maintenance field)

SEVEN DAYS IN USA ON $25 AND A PINT OF BLOOD 7
(A little ingenuity can take you a long way)

LMM STUDY PERIOD - 1970 8

PRIMES A L'INITIATIVE - ADJUM DA HALL 9
($505 pour avoir suggéré une modification à la méthode utilisée pour le transport de l'équipement de vérification)

HOW ABOUT A LORE BADGE? 10
(We have some ideas - how about yours?)

SGT O'SWEAT'S HEADACHE AND ASPIRIN DEPARTMENT 11

A STRANGER IN THE REGIMENT 12
(Some sound advice to maintenance personnel now serving or expecting to serve with a regiment)

BROTHER, HAVE YOU A DIME FOR A SPARE? 14
(Some possible answers to the shortage of radio spare parts)

SUCCESS STORY - LT L.R. KALYNIUK 15
(Who says there is no future in the Canadian Armed Forces!)

LAND ENGINEERING TEST ESTABLISHMENT 16
(One of the more interesting units in the Land Maintenance environment)

THE VALUE OF VALUE ENGINEERING 18
(One aspect of the US Dept of Defence's efforts to save tax dollars)

PRODUCING THE "NEW" TRADESMAN 20
(Current information of interest to <u>every</u> tradesman, on the new Canadian Forces Training System)

REDUCTION IN MILITIA 25
(Twenty Technical Squadrons minus Twelve = Eight)

COMMENTS ON ARMORED AMPHIBIANS 26
(Here's how they do it in Russia)

CWO J.L. MERCER RETIRES 28

REPORT ON THE RCEME (CA(R)) CORPS OFFICERS' FUND 29

LORE OFFICER CLASSIFICATION 30
(The latest information for LORE officers concerning scope and areas of employment)

ORIGINS OF MANAGEMENT 32
(Funny - I thought this was all new)

REME TRAINS IN CANADA 33

THE LAND ORDNANCE REPAIR DATA SYSTEM 34
(Changes are coming in the '2149', Time Cards and computer print-outs)

CFHQ TECHNICAL NOTES 36

SUPERIOR BUS - ALTERNATOR FAILURE 37

THE MILITIA PAGE - 39 TECHNICAL SQUADRON 38

WHO'S WHERE - RCEME CWOs and MWOs 39

EDITORIAL

This edition of the Technical Bulletin contains many more articles than the last edition. The staff appreciates the time and effort expended by the many authors who contributed to make this one of the better issues. Articles by some authors could not be published because they were received just as we were about to go to press. If sufficient new material is received in the next three months the staff will, in deference to the maintenance community's wishes, produce another Technical Bulletin.

Due to lack of talent on the staff, the French article in this issue may not be written in the most fluent style, but it is grammatically correct and it does get the message across. For those who have the enviable ability to write in French, do not let our lack of talent discourage you. Send your articles written in French abd we will publish them.

The staff hopes to continue to serve the new maintenance community by publishing the Technical Bulletin. But, because of our position in the hierarchy, we are unable to obtain the information necessary to continue without the active support of all other maintenance units and personnel. Our future, if there is to be any, is now in the hands of the new community of maintenance men.

The DEVIL Is a Maintainer

By Maj (L) M.C. Johnston, Capt (A) M.A.S. MacNamara, Lt (N) C.D. Allen

Lt Allen has many years experience in the electronics side of the Navy and, as well, is a qualified diver. Capt MacNamara has several years experience in the management of armament equipment in the Air Division and recently, Materiel Command. Maj Johnston has served in several army workshops, including a tour with 4 CIBG. The authors now form one of the study teams on the DEVIL Maintenance System Working Group.

****

Here is your chance to learn more of the DEVIL and still keep out of trouble.

The DEVIL Program now includes maintenance. Surprised? Well don't worry - most people are familiar with the term 'DEVIL Program' and are aware that the DEVILs have been toiling mightily over the past four years in planning a unified supply system for the Canadian Forces.

The word DEVIL, however, is an acronym for DEVelopment of Integrated Logistics. And logistics in the Canadian Forces definition includes Supply, Maintenance, and Transport. The last two were not originally included in the DEVIL Program. It wasn't until Sep 1968, when the DEVIL Maintenance System Working Group (DEVIL MSWG) and the DEVIL Transportation System Working Group were formed, that the DEVIL Program finally attained its full scope.

Why did it take so long to get the DEVIL MSWG into operation? In late 1965 the general thinking within the DEVIL Program was that any maintenance input to the supply integration program could be provided by a small tri-service group of maintainers within the Director General Maintenance (DGM) organization. It was soon realized that such maintenance input would be a tri-service input and, as such, would be unsatisfactory since it could provide, literally, three answers when only one definitive answer was wanted. Nor would the answers provide a basis for designing mutually compatible supply and integrated maintenance systems.

Consequently, in mid-1966 the DGM produced a paper which noted that the policies, practices, and manuals of the Navy, Army and Air Force differed not only between the services, but also within the individual services. While recognizing that some of these differences were the product of necessity, it was noted that they would, if unresolved, present formidable and possibly insurmountable obstacles to the integration of support services.

It pointed out that:

- the maintenance accorded similar equipments, filling a basically similar role, differed from service to service;
- that the maintenance resources of each service were differently organized, controlled and expended, and
- that there wasn't much information which was available to management in a form which could aid in determining whether the total Canadian Armed Forces maintenance potential was in keeping with operational requirements or with good management practice.

Subsequently, another paper was produced which identified the major projects that required investigation. It was approved in principle in Aug 1967 but approval to implement was withheld until a more definitive plan was produced. The DGM was then directed to produce such a plan which appeared as the Canadian Forces Maintenance System Design Handbook and was approved in June 1968. The following September the DEVIL MSWG was formed and work started on designing a unified maintenance system for the Canadian Forces (CF).

Thus the DEVIL Maintenance System Working Group was formed to give a unified approach to the study of Canadian Forces maintenance. But, is such a study needed? The answer is yes, for three reasons. Compatibility with the supply (that is, any other logistic) system, as described above, is the first. The other two have force-wide implications.

Unification of the Canadian Forces has resulted in a redistribution of maintenance responsibilities with little apparent consideration having been given to the overall maintenance organization which this type of force requires. Within the Navy, Army and Air Force conduct of maintenance varied widely, and to a considerable extent still does. There is no guarantee that the present three maintenance systems are or ever will be economic or suitable for a unified force.

According to recent figures, the maintenance bill for our forces is about a fifth

of the defence budget. Therefore, any savings to be made in maintenance would be significant in view of the present restricted budget. It then makes sense to review the maintenance picture to determine what is required of the maintenance system to fill the needs of tomorrow's forces at the best price tag.

The purpose of the DEVIL Maintenance Program then, is to produce a maintenance management system and the management tools to make this system work. Note that there is no intent to change the basic job that the worker is doing. Our task is to produce, for the Maintenance Managers, a system by means of which they can more effectively and efficiently carry out their task.

The design objectives of our program then are to produce:

- a maintenance organizational structure for the CF, complete with terms of reference;
- a maintenance management system for the CF to be known as the Canadian Forces Maintenance System (CF MAINT S);
- a uniform series of CF Maintenance Technical Orders, and
- uniform format, terminology, and indexing of maintenance documents.

The design concepts for the CF MAINT S include the following points:

- the system must satisfy now, and in the future, the operational requirements of the CF;
- the system must be as uniform as is economically feasible, however, it may have to cater for special environmental requirements. We envisage that these environmental differences will likely occur only at the unit/base level, while at the command and CFHQ level priority will be given to uniformity in the interests of overall co-ordination, speed and efficiency;
- and finally, maintenance must be managed as an entity. This means that there will be a single maintenance authority and line of responsibility from CFHQ to the lowest level of maintenance.

Who is carrying out this review of the maintenance picture? How is it being done? The DEVIL MSWG consists of a small co-ordinating cell and six three-man study teams. Each team has a representative from the sea, land and air element. The technical qualifications and experience of team members were considered when the teams were made up in order to ensure that there was a balanced mix on each team. Although our group reports through the DEVIL Program Manager to the Deputy Chief of Logistics in the Chief of Technical Services Branch of CFHQ, we work closely with the DGM.

As mentioned before, studies have shown widespread differences between the maintenance systems of the Navy, Army and Air Force. Each service had developed in isolation from the others a system which was geared to their prime equipment, i.e., ships, gun and tanks, and aircraft. However, we soon discovered that each of these maintenance systems was made up of the same basic elements (workshops, parts list, work order, repairmen, spare parts, servicing, rebuild, etc). As a result, we concluded that we could best carry out the review by studying individually each of the elements that make up a maintenance system. Therefore, we have embarked on a four-year study program consisting of fifty discrete yet co-ordinated studies (one for each maintenance element). These studies, by their nature, fall into five main groups: Publications, Interfaces, Management, Maintenance Management Information System and Organization.

Let us look first at the Interface Studies. The fact most evident from our early examination was that maintenance by no means meant the same thing to each of the services. Our starting point in the program then, was to arrange a series of studies with the major organizations with which maintenance interacts - Operations, Personnel, Comptroller, Supply, Construction and Design Engineering.

The prime purpose of these studies is to define the maintenance task. When the interface studies have been completed, there should emerge a complete picture of the maintenance task and the tasks of other agencies as they relate to maintenance. An immediate benefit is available from these studies. Where the pressure of present needs requires interim procedures, these procedures can be devised within the framework of responsibility that will be outlined in the Interface Studies. As a result, the extent of changes required when the CF MAINT S is adopted will be minimized.

Following the Interface Studies are the Management Studies which include devising policies and procedures for the management of maintenance and consequently are the most important part of our program. It was decided first to determine how to manage Maintenance Actions - and when this is known - to study the management of Maintenance Resources required to perform these tasks.

The methods of planning, scheduling, and controlling maintenance will be standardized throughout the force. The aim of Maintenance Actions is to ensure the optimum use of maintenance resources in providing Operations with serviceable equipment in the priority Operations sets. In each of the resources areas (personnel, tools, spare parts, facilities) the aim will be to provide a single set of policies and procedures to govern the acquisition, control, and expenditure of maintenance resources.

From the Management Studies the information needs of managers at all levels will have to be established. We can then begin the Maintenance Management Information System (MMIS) Studies which will define the data needed, the documents to be used for the MMIS, and will culminate in the preparation of an overall specification for the MMIS.

The information system design will reflect the maintenance information needs of all managers throughout the CF. The specification produced will detail the methods and procedures by which data is to be collected, collated, analyzed and disseminated. The MMIS will form part of the overall CF information system.

The organization studies follow naturally from the Interface and Management studies. It is not the intention of the MSWG to attempt to inhibit local Commanders from exercising their prerogatives to employ existing resources in the best manner to meet current needs. Nevertheless, there is a degree of standardization required, and it will probably be no less than the following:

- specify that at each command level there must be one Maintenance Authority;
- promulgate the policy that the maintenance chain of command and the administrative chain of command are not synonymous. (Direction and policy for the maintenance function must flow from CFHQ/DGM to CHQ/Senior Maintenance Officer to Base/Senior Maintenance Officer);
- standardize Maintenance Structures and assign Terms of Reference at each level.

The last group of studies is the Publications Studies. These studies are concerned with format, content, indexing and terminology of maintenance publications.

As you are aware, there are now several different sets of maintenance instructions in use within the Canadian Armed Forces. Arising, as they did from differing backgrounds and produced (with some minor exceptions) without inter-service co-ordination, these maintenance instructions vary in approach, scope and application. As a result, equipment operated under similar conditions is being maintained in accordance with technical instructions which vary considerably. In a unified force, in which ALL service environments may form part of any maintenance organization, it is no longer practicable to operate with conflicting or overlapping maintenance instructions, nor is it economic to operate with several systems of maintenance instructions. This problem is already becoming acute in some areas. Consequently, it is necessary to develop uniform maintenance instructions, applicable to all equipments, users, and maintenance functions; allowing only for those deviations required by special environmental conditions. These uniform maintenance instructions will be known as MATOs, acronym for Maintenance, Administrative, and Technical Order.

In regard to the format of MATOs, a review of existing maintenance orders showed remarkable similarities in many areas such as format (shape, size and layout) and the way in which information was presented (procedural steps, parts lists). Standardization hence was possible and a common format specification has been produced and approved.

MATOs must embrace the complete range of CF maintenance requirements. In order to achieve this, Order Content Specifications must be produced for each recognizable function area for which maintenance orders or instructions are required. The order content specifications, when produced, will provide the guidance required by the authors of MATOs. In addition, guidance, in the form of minimum-requirement specifications, will be provided for those personnel who must approve purchase of maintenance instructions from civilian sources. A total of 13 functional areas have been identified and scheduled for study. Some of these activities are: Equipment Operating, Servicing, Preventive Maintenance, Corrective Maintenance, Equipment Performance, Parts Identification, Materiel Scaling and so on.

There are already a number of maintenance publications in existence. It is intended, however, that only one official "maintenance bulletin" will be authorized. Its prime purpose will be to assist maintenance personnel to keep abreast of current trends in the maintenance field, to amplify or emphasize maintenance instructions, to provide a forum for discussion and to improve the

exchange of ideas by personnel. Consequently, there is a study to determine the type and 'format' of a periodical, best suited, for the maintenance organization.

Although the study of the format of maintenance management documents is part of the Maintenance Management Information System studies, mention is made of it here because it involves pieces of paper such as the Unsatisfactory Condition Report, Technical Failure Report, Work Crder, Maintenance Contract, Equipment History Documents and the like. We feel that a measure of standardization between environments can be introduced and that this standardization will improve the efficiency of maintenance management while at the same time it will not hinder the man on the workshop floor.

There is a requirement for an indexing code system for the maintenance organization. Basically, the system must categorize all materiel required or required for maintenance, as well as organizations, and the types of MATOs. This categorization has been completed and an alpha-numeric code applied. This coding is computer applicable, so that maintenance data can be collected, stored, collated and extracted from the computer as required. It will provide a standard method for the registration of equipment and has been designed to permit the unique, or individual identification of equipment parts much like the present Work Unit Code. This indexing system, the Technical Data Index (TDI), has been approved. It is planned to take it into use gradually by applying it to new equipments as they appear and continuing to use current instructions until the equipment they support is phased out.

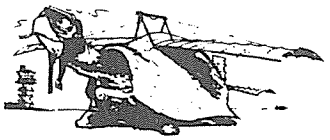
There you are, a capsule survey of: why we are, what we are, and what we are doing in carrying out our studies in designing the CF MAINT S. Most of the Interface Studies have been completed or are near completion. Many of the Order Content Studies are near completion and implementation of these along with the already approved TDI and format of MATOs is being planned right now. We have started into the Management Studies.

Will all this result in a complete shake up in the maintenance world? It is too early to tell yet. We have in mind the practical point of minimizing changes. However, remember that our element by element review will ensure that each maintenance procedure you use is the best one wherever you are - on a shop floor, in an engine room or flying an aircraft.

* * * * * * * * *

Reprinted from Flight Comment

That rock's a turtle!



Private aircraft: "Kansas City tower, you might inform the TWA aircraft about to take off from the north end that the object near my position that looks like a rock is really a turtle on the runway."

TWA 707: " Tower, we heard that transmission. Understand one turtle crossing the runway."

Tower: "Based on available pilot reports, turtle's course is oriented southeast, heading toward gate five."

TWA 707: "Tower, can you give us info on turtle's speed and estimated time of runway clearance."

Tower: "Computer calculations indicate turtle's speed around 200 feet an hour - may be less in this quartering headwind. If present course and speed are maintained runway should be clear in eight minutes."

TWA 707: "Unable to wait due to fuel depletion. Will employ evasive action on takeoff roll."

Tower: "Roger, TWA cleared for takeoff. Be on alert for wake turbulence behind departing turtle."

SEVEN DAYS IN U.S.A. ON $25 AND A PINT OF BLOOD

Reprinted from "The Craftsman", December 1969

For most of the year Cpl Stanley Cribbett, a REME fitter, works side by side with Royal Signal Technicians of 13 Signal Regt at Birgelen on the German/Dutch border. This summer he and three of his colleagues accepted a challenge by their CO to devise and execute a suitable scheme to show their initiative. The only condition laid down was that the scheme should not take longer than seven days and they could expect no financial aid from the Regiment.

The four set themselves the task of getting to America, seeing the President and the highest ranking officer they could find of the US Army Signals, at a cost of not more than 25 dollars.

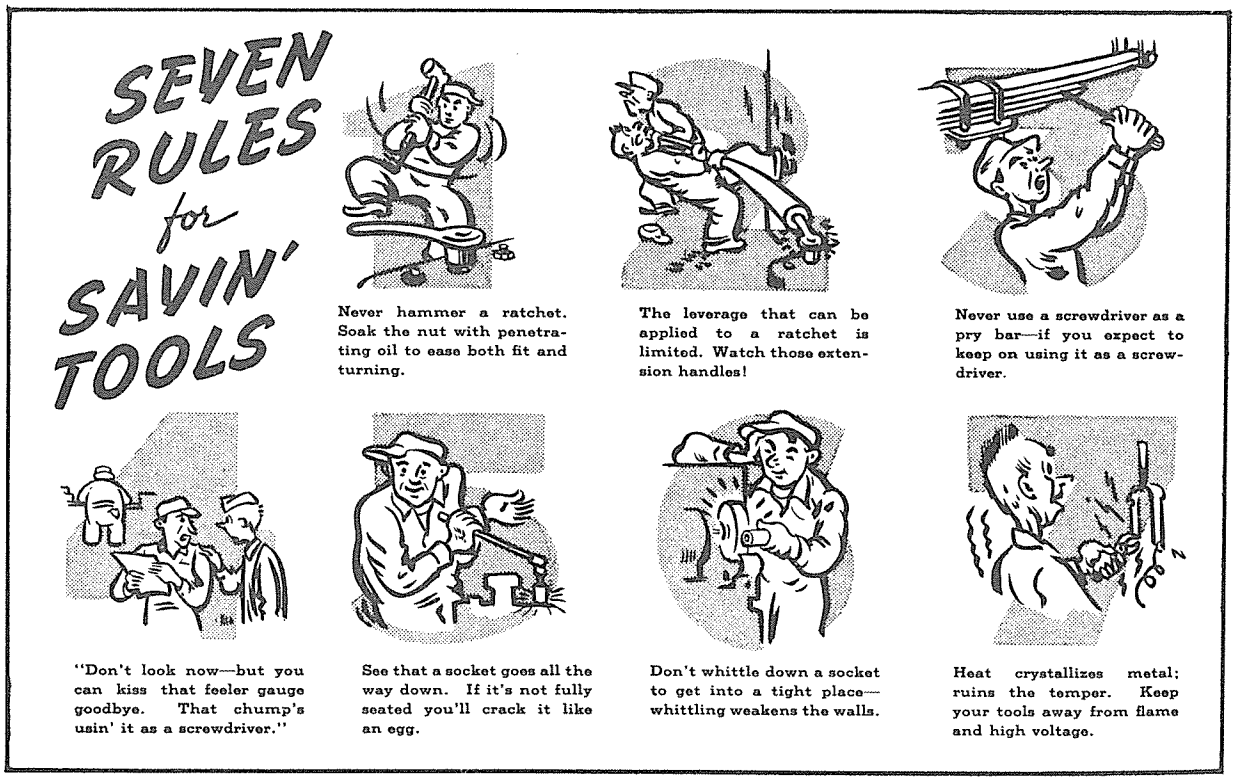
After many setbacks they scrounged a lift on a German Luftwaffe flight from Cologne to Davison Airfield, Washington -- only 30 miles from their target of the White House and the Pentagon.

The coach fare of $2.20 from the airfield to Washington was too much so Cpl Cribbett shouldered his pack and all started walking. The temperature was over 100° and they were most grateful for the lift offered by an astonished US Navy Lieutenant -- astonished because they were wearing British Army shirt sleeve order.

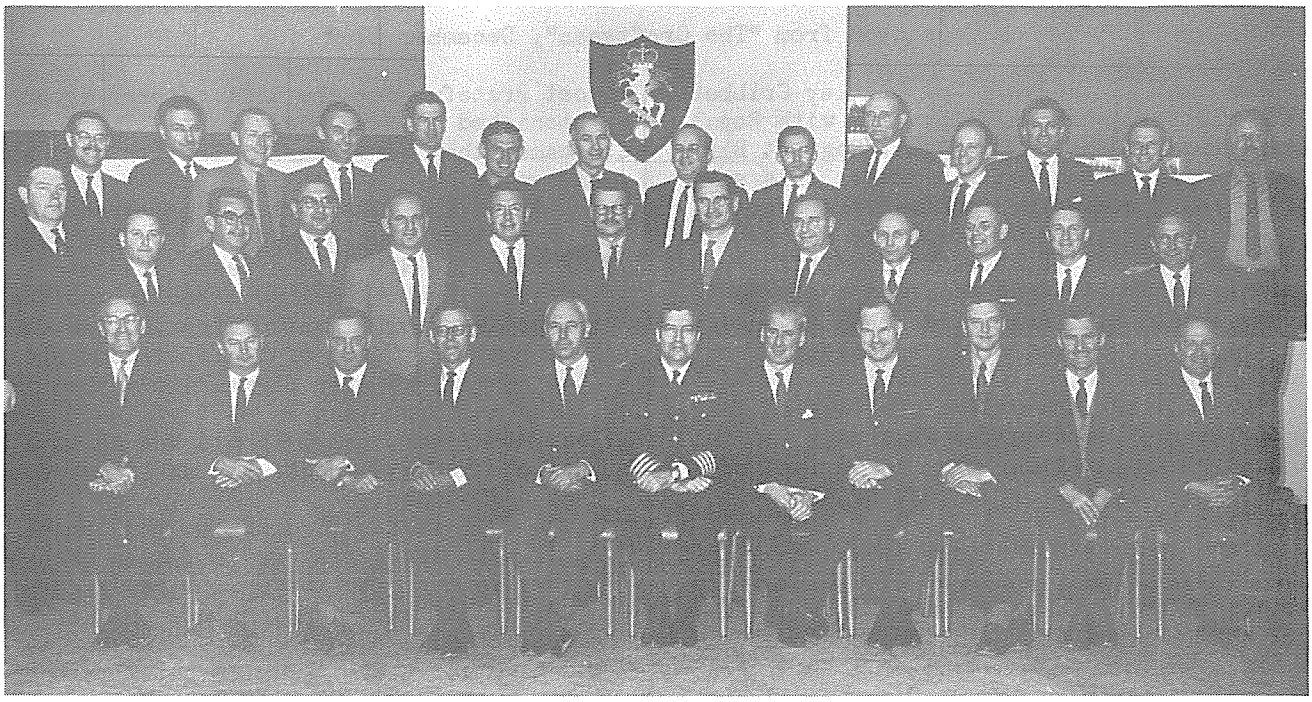
After a quick sightseeing tour of Washington, they were dropped off at the Pentagon and here the NCO at the reception desk took two steps back when they asked to see the highest ranking Signal Officer. Major-General G.E. Pickett, Chief of Staff of Communication Electronics, US Army Signals, saw them immediately and from then on most of their problems were over. Cpl Cribbett was given a VIP tour of the White House and saw the President from a distance.

A four seater aircraft to the School of Signals in New Jersey and a return trip by Luftwaffe from New York had already been laid on but funds were running low. Cpl Cribbett then spotted a blood bank and in they marched and came out a pint lighter but $5 richer. A final steak supper in New York and back to Birgelen within the seven days allocated.

Cpl Cribbett still has a dime in his pocket and is thinking of next year's project.


SEVEN RULES for SAVIN' TOOLS
Never hammer a ratchet. Soak the nut with penetrating oil to ease both fit and turning.
The leverage that can be applied to a ratchet is limited. Watch those extension handles!
Never use a screwdriver as a pry bar—if you expect to keep on using it as a screwdriver.
"Don't look now—but you can kiss that feeler gauge goodbye. That chump's usin' it as a screwdriver."
See that a socket goes all the way down. If it's not fully seated you'll crack it like an egg.
Don't whittle down a socket to get into a tight place—whittling weakens the walls.
Heat crystallizes metal; ruins the temper. Keep your tools away from flame and high voltage.

LMM STUDY PERIOD - 1970



Back Row - Lt CG Ashdown, LCol WG Svab, Maj RE Goulding, Maj NE Laviolette, Maj PM Graye, Maj HD Byer, Maj PEV Hansen, LCol RW Libbey, Maj KI Anderson, LCol RC Rivers, Maj WRL Springford, LCol KT Kennah, LCol DV Geary, LCol DJ Tidy.

Center Row- Maj DV Hampson, Maj BL Code, Maj CR Morgan, Maj PP Pospisil, LCol(A) HE Hendrickson, LCol FW Chapman, LCol RF Fendick, LCol FG Johnson, LCol BB Cox, LCol J Adams, LCol KR Joslin, LCol RB Screaton, LCol SA Girdler.

Front Row - LCol WH Glover, LCol M Ruscher, Col WJ Owens, Col LH Wylie, Col KR Ward, Col AL Maclean, BGen A Mendelsohn, Col(A) WM Diggle, Col JC Boughton, LCol AGM Maitland, LCol AL MacDonnell.

By LCol K.R. Joslin

The 1970 Land Materiel Maintenance Study Period was held in CFB Kingston from 21 to 23 January 1970. Approximately 45 officers from CFHQ, Mobile Command, Air Defence Command, Air Transport Command and Training Command attended the study period, which had as its aims:

a. To provide an opportunity to discuss recent developments affecting the land materiel maintenance organization and, by the exchange of ideas, to assist in increasing the efficiency of that organization.

b. To inform all concerned of recent activities and decisions which will affect the future of the land materiel maintenance organization.

c. To air problems that have arisen in the land materiel maintenance organization in recent months and to obtain the views of experienced officers on possible solutions.

These aims were achieved by prior selection of topics which were informative and which would provide a basis for question periods. In some instances the question periods proved to be too brief and the discussion had to be terminated to allow the programme to proceed on schedule. This resulted in many mini-discussions being conducted in the "other conference room".

The study period was opened by Colonel A.L. Maclean, Base Commander CFB Kingston, and continued with presentations by: CFSCLOE,

1, 2 and 3 Combat Groups, 4 CMBG, 5e G de C, Air Transport Command, Air Defence Command, CFHQ, 202 Workshop Depot, Mobile Command, CFB Halifax, CDLS Washington, and the Detroit Arsenal. The major presentations were by: Cmdre R.J. Pickford, CFHQ, on the "New Force Structure", Mr. W.D. Shuttleworth, CFHQ, on "Industrial Relations in the Public Service" and LCol A.L.D. MacDonnell on "Implications of the New Force Structure on Mobile Command with Emphasis on Maintenance". BGen A. Mendelsohn, DGM (now DGOS) and Colonel K.R. Ward DOM, gave reports on their activities in CFHQ with emphasis on future trends. Land maintenance activities in the air and sea environments were described by Colonel W.M. Diggle and Lt C.G. Ashdown of Air Defence Command and LCol K.T. Kennah, BTSO in CFB Halifax. These speakers highlighted the problems which arise in the maintenance of land equipment as a minor activity in an organization which is designed to support a major activity in a different environment.

The study period included a cocktail party which was attended by the delegates as well as by serving and retired officers, and their wives, in the Kingston area. This provided an opportunity to renew old friendships, as did the Corps of RCEME Dining Out Mess Dinner held the evening of 23 January and which saw some 130 officers dine out 23 of their brother officers, 18 of whom were present at the dinner.

A gauche, ADJUM Hall, au centre, le Major N.E. LaViolette, à droite, le Lieutenant-Colonel J. Garneau, Commandant du 5e Bataillon des Services du Canada.

Primes à l' Initiative

ADJUM DA HALL

Adjudant-maître Hall a reçu $505.00 pour avoir suggéré une modification à la méthode utilisée pour le transport de l'équipement de vérification. La méthode adoptée permet une économie de plus de $4,000.00 par année.

Adjutant-maître Hall est le responsable du peloton d'armements et de l'électronique à la Compagnie d'entretien du 5e Bataillon des Services du Canada, Base Valcartier.

Après six mois d'observation sur le système utilisé afin d'acheminer l'équipement de vérification à être calibré au Centre de Calibration de l'Atelier 202 à Montréal, l'Adjudant-maître Hall a décidé d'entreprendre une étude afin de déterminer le moyen le plus économique de transport de la Base de Valcartier à Montréal. Précédemment, l'acheminement se faisait par véhicule militaire à un coût annuel d'environ $4,930.00. Ceci incluait le salaire des militaires, les repas des militaires, la détérioration de l'équipement, etc... Maintenant l'équipement est acheminé par train à un coût d'environ $735.00 par année.

Pour cette initiative, l'Adjudant-maître Hall a reçu un chèque et un certificat des mains du Lieutenant-Colonel J. Garneau, Commandant du 5e Bataillon des Services du Canada, en présence du Major N.E. LaViolette, Chef de l'Entretien de la Base.

HOW ABOUT A LORE BADGE?

With the Officer Classification System becoming a fact on 1 Jan 70, it would appear that the days of the corps badges are becoming numbered. Yet, it seems we should have something to identify the "family of fixers".

For lack of a better term, our title refers to a LORE Badge. We realize that LORE is a classification referring to officers only and, since we do not wish to exclude the other ranks, LORE doesn't really encompass all we had in mind. Even the use of the word "badge" is used loosely. This implies that it will be worn as part of the new Canadian Forces uniform and we, of course, are in no position to say what badges or symbols will be used.

Perhaps what we are really looking for is a "Land Maintenance Symbol" - something that will show that the LORE officer, the Veh Tech 411, the El M Tech 431, the Wpns Tech L 421, etc., are all part of the same family and share something in common.

How do you feel about this? Have you given it any previous thought? We hope that this article will foster both thought and discussion, and then perhaps - a little action. Here's what we would like you to do.

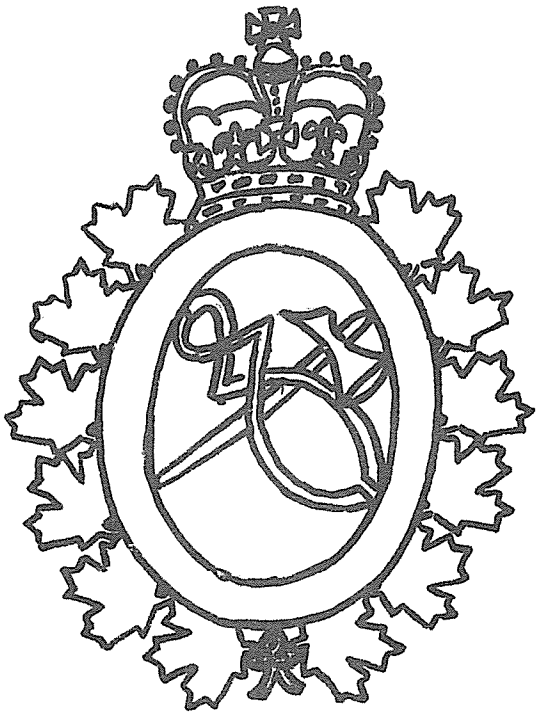
The following designs were produced here at CFB Kingston, merely as a result of discussion about the subject of this article. We felt you should see them, to give you some idea of what we are talking about. Now, how about getting a blank piece of paper, felt tip pen or pencil, and send us your idea. Just to keep the record straight, this is not a contest and there are NO PRIZES. We will, however, print all or a number of the better designs in the next issue.

A query to CFHQ provided us with some basic guidelines concerning the design of badges (there is that word again). To standardize the submissions, and in case your idea is adopted as a badge, we ask you to please make up your design with the following in mind:

(i) the basic design must be an oval.
(ii) outside the oval, a wreath of styalized maple leaves.
(iii) a motto, if used, shall be on a ribband covering the lowest four maple leaves.
(iv) any writing in English must also be translated into French.
(v) the whole to be surmounted by the crown.

Forward your design to The Editor, The Technical Bulletin, CFB Kingston, Kingston, Ontario. Be sure to include your rank, name and unit.

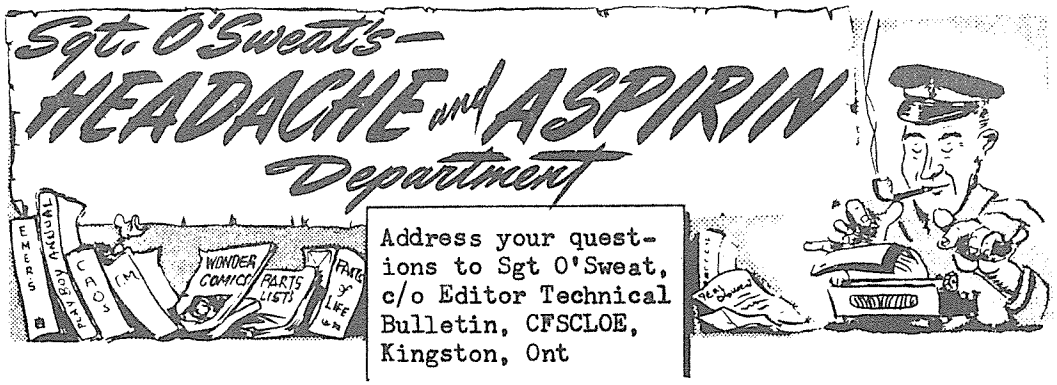
DESIGN NO 1



Sgt KA Prescott, CFSCLOE

As its central theme Design No 1 uses the crossed hammer and tongs, representing the craftsmen's trades from which the land maintenance element draws its personnel.

Continued on Page 13



Dear Sgt O'Sweat,

I read, in the Nov 69 issue, the exchange with your Ma about your not getting mail from the boys. Well, maybe the boys don't write because, lately, the Technical Bulletin has been a sometime thing. I mean, what's the use of writing if your letter won't be published? Another thing, the Nov 69 issue didn't get into my hands 'til the first week of Feb 70. Not very current, eh?

I would suggest, Sarge, that you talk to your editor about frequent and regular publication so that the boys get in the habit of seeing the Bulletin at the same time every month or so. Another suggestion is that some means must be found to circulate the Bulletin in less time than it took the Nov 69 issue to filter down to the boys.

I realize that slow circulation is not totally the fault of the Bulletin staff, (there must be a lot of IN baskets sitting around waiting to trap the Technical Bulletin as it wends its merry way from the printing press to my desk), but larger printings would possibly reduce the waiting time, thus making the Bulletin articles more relevant.

Anyway, Sarge, now that the Bulletin is back in business, I hope you get lots of mail to help keep your mind off the Playboy fold-outs.

Sincerely,

J.A. Wilson (WO)
202 Workshop Depot (MTG)

Dear WO Wilson,

Thank you for your kind(?) words. Your letter proves what I have been telling the Editor all along - somewhere there is at least one person that reads my column.

Your points are well taken and some explanations are in order. Firstly, about the Technical Bulletin being a "sometime thing". Early last summer both the Editor and Executive Editor were posted, taking all their experience and know-how with them. Naturally, it took some time to find others to fill their shoes and get the magazine back "on the track".

As for publishing the Technical Bulletin every month or so, there is nothing the Editor would like better - that is, if there were sufficient time and material. Traditionally, the Technical Bulletin has been a quarterly publication and the staff is doing its best to meet deadlines to keep it so. If I told you all the problems the Editor and Exec Editor have, you would understand why they both have so little hair (it has been torn out in frustration).

Now, about the time lapse! The staff try to anticipate when the magazine will be returned from the printer and date it accordingly. This doesn't always work. The printer also has problems (doesn't everybody) and priorities to meet so we sometimes get shoved back to the tail-end of the line. This is what happened to the last issue.

I hope this answers a lot of questions for you and other readers, Warrant, and I have passed your letter on to the Editor and his staff so they realize they will have to pull up their socks and not leave most of the work to an old soldier like me.

O'Sweat

A STRANGER IN THE REGIMENT

By LCol K.R. Joslin

The title of this article is one of the observations contained in the Confidential Report on page 35 of the May 1969 issue of the Technical Bulletin. These observations were made on the officers of an infantry regiment of 157 years ago. Is it possible that the one I have chosen as my title could be applied to any of our officers, warrant officers or NCOs today?

As the Corps of RCEME we had many members filling positions in units of other corps and, as Land Ordnance Engineers and Land Maintenance Technicians, we will continue to have small groups of individuals serving in similar situations. The success with which these groups or individuals perform the role for which they are provided is dependent, to a large extent, on them being accepted as "members of the family" and not being "strangers in the regiment".

Let us consider the posting of a captain to command the maintenance troop of an artillery or armoured regiment. New officers are posted into such regiments all the time but, with few exceptions, they are members of the corps or regiment. The new maintenance troop commander is a "stranger in the regiment". Not only is he a newly posted officer but he wears a different hat badge, he has had different training, he has different experiences in his background and, to some degree, he does not even speak the language (or at least, the "patois") of the regiment. If he is lucky he will have been on course with one or two of the officers and won't be a complete stranger.

The first task which he must accomplish is to become accepted by the regiment as an officer of the regiment. This does not imply that he will be ignored; he and the regimental officers are all in the same service and they will have mutual friends and some common interests. What is implied is that he must become a member of the team and not be just a fellow spectator at the game.

To do this, he must set out to learn what the role of the regiment is and how it is performed. This will not only enable him to understand what the regiment is doing, but it will allow him to discuss operational activities intelligently and to provide better service to the regiment by employing the resources of the maintenance troop in the most efficient manner.

At the same time, he must make a good impression on the regiment. He must show that he is willing to take an active part in the day to day life of the regiment. This day to day life has two main facets - a military one, which is the reason for his being with the regiment; and a social one, which provides an opportunity for informal contact outside duty hours.

In military matters he must ensure that he conducts the maintenance support of the regiment in a competent, professional, military manner which leaves no doubt that he is first and foremost a military officer. His technological knowledge is secondary to his military knowledge and, while essential to the performance of his task, it must not overshadow his military knowledge.

In social matters, he must tread gently until he has determined the standards expected of him and has discovered the local taboos. After determining the ground rules he should take an active part in the social life of the regiment, not just to be a social butterfly but to cement the friendships made during working hours and to make new ones. I do not intend the foregoing to imply that this officer should become a permanent inhabitant of the bar. Some socializing does take place in the bar but it also takes place in the dining room, at coffee breaks, at mess parties and in private homes. It is probably impossible to drink your way into any unit's social life.

The individual posted to a unit or headquarters as its "Chief of Land Maintenance" must adapt to the parent organization. This does not mean that he must conform to the detriment of his maintenance task or that he must relegate this task to a secondary duty. Rather, it means that he must provide maintenance services within the organizational and operational restrictions imposed by the role of the unit or headquarters. Summed up - his job is to provide a service. In our maintenance role we could adopt the motto of one of the big electrical companies and adapt it to suit our needs as " Service is Our Most Important Product". Adaptation must take place in both the military and social aspects of employment if it is to provide the basis for the provision of effective maintenance support.

The acceptance of a group of maintenance personnel by a larger organization will be

facilitated if the group adapts in the same manner as I have said about an individual. The group can also participate in unit sports activities and extend their participation in the life of the parent unit into this area. In one sport at least, shooting, we seem to excel and a good rifle team can go a long way in fostering new friendships.

The ideas set out here are by no means exhaustive. I have attempted to set down a philosophy rather than to write a new version of "How to Win Friends and Influence People". I feel that the family relationship must be deliberately fostered and that any effort it costs us will be well spent in that we will be able to perform our role more effectively.

I do not think any of us need to receive a report which says "A stranger in the Regiment", when we can very easily receive one which says "A member of the Regiment who has served it well".

IT'S ALL IN THE WEIGHT

By Capt RE Betzner

Classical problems in mathematics have that unique property of commanding the absolute attention of those attracted to them. To attract you to this fascinating recreation, I am about to introduce you to one of those problems which has this distinction. The characteristic question is the essence of simplicity but on becoming entangled in its grasp one is intrigued by the evasiveness of the answer.

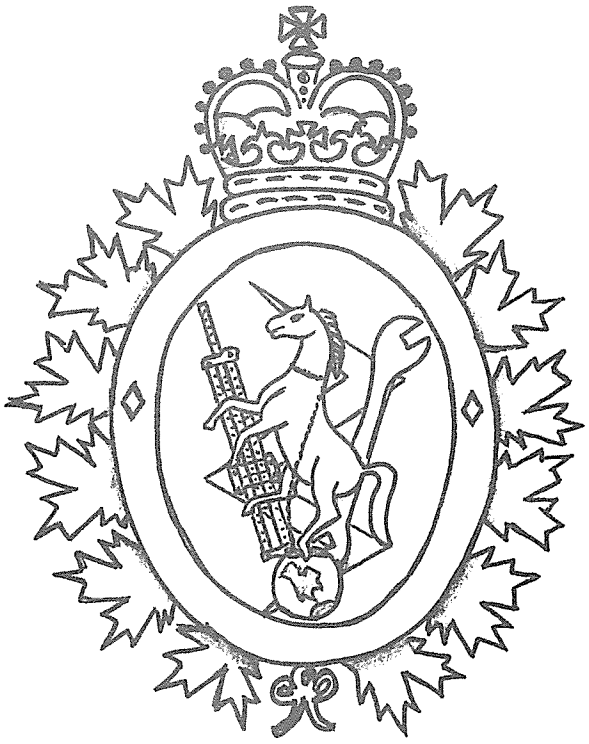
Among the most interesting, this problem requires one to determine: THE LEAST NUMBER OF WEIGHTS WHICH WOULD SERVE TO WEIGH ANY INTEGRAL NUMBER OF POUNDS FROM 1 LB TO 40 LBS INCLUSIVE.

One scholar suggested the series of weights 1, 2, 4, 8, 16 and 32 as the solution. There is a better one.

Send your suggested solutions to Capt RE Betzner, CFSCLOE, CFB Kingston, or read the answer in the next issue.

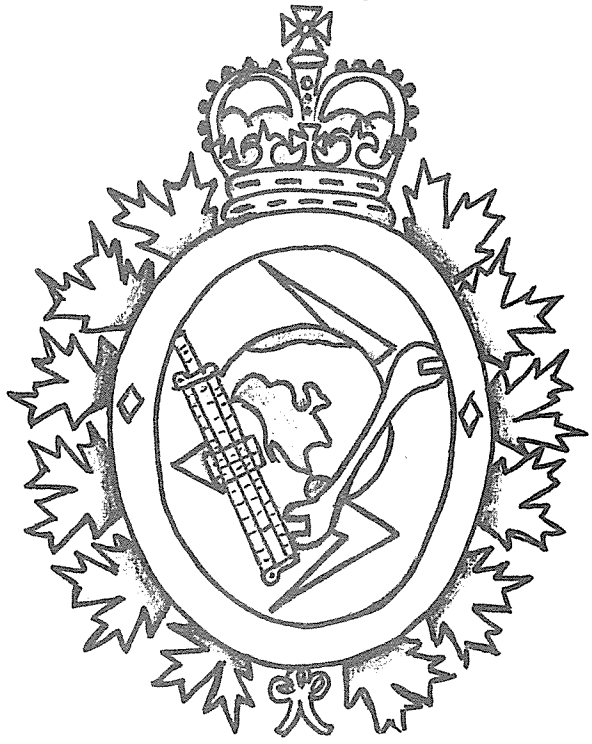
Continued from Page 10

DESIGN NO 2



Capt JK Murata, CFHQ

DESIGN NO 3



Capt JK Murata, CFHQ

Continued on Page 17

BROTHER, HAVE YOU A DIME FOR A SPARE?

Reprinted from ELECTRONIC NEWS, NOVEMBER 3, 1969

The Pentagon is ending up marooned around the world with a lot of "electronic flat tires" -- simply because the military is not buying enough spares. And industry feels it is being unjustly blamed.

A growing mountain of electronic gear is piling up at military repair depots -- much of it gathering dust because there are no spares on hand to fix it, marketing officials say.

They are under increasing fire from military project people because of excessive down time of equipment in the field. But when companies delve into the complaints, they find too often the gear is simply standing on depot shelves for lack of spare parts. And that is clearly the fault of Pentagon budget cutters, industry managers counter.

Spares are the least glamorous part of any procurement. Since they can take up 25 to 40 percent of the total cost of a program, spares are held to a bare minimum. The military project office, caught in a tight budget squeeze, wants to put as many dollars as possible into the main weapon itself. So in the past 2 years, money for spares has kept going down -- to get more funds for the system itself.

Company vice-presidents in Washington expect even more short-changing on spares in the future. And predictably they see even more gear in repair depots looking for a spare part.

The parts shortage is said to be acute in field radio gear. However, it reaches even to the highest level systems. It was learned that the Air Force refused to add Autodin digital data interfaces to its own L-system long-haul communication nets -- until the Army could guarantee it had enough spare parts on hand to support the Air Force portion.

The spares drought becomes more acute as the Pentagon keeps existing weapons and communications in service longer to put off buying new equipment. The older gear, pushing the limits of its lifetime, must be repaired more frequently, so even more spares will be needed.

For its part, the military replies that spares are a major logistics headache. Two project managers give a typical rejoiner: With supply lines circling the globe, the military services must buy spares close to the belt or risk ending up with more spares in inventory than systems in the field.

One logistics colonel still smarts from post-Korean War Congressional grilling that claimed the Army had a 100-year supply of jeep axles in stock.

"We walk a fine tightrope. Too many spares in stock and we face the wrath of Congress for waste. Too few spares and we are damned by everyone for bad planning."

Industry generally prefers project managers to err on the side of abundance in spares. This is high profit business -- as close to off-the-shelf "come and get 'em while they're hot" commercial selling as military systems makers get.

Also spare parts sales are one way to ease the tight profit restrictions on fixed price development contracts. One bidding strategy is to accept your lumps on the hardware development itself -- but make your money on a long and continuing spare parts business.

But when the customer cuts back on spares this gamble can backfire.

"Even if the project office wants to cut back on spares, at least don't blame us when the equipment is held up in repair depots for lack of parts", said the marketing chief for one broad-line Government supplier.

Too often, he fears, his firm gets a bad name through military channels for equipment down time when the military's spares penny-pinching is to blame. And he sees little that the firm can do, except push harder with the project office to put more spares in the original procurement buy.

Industry believes the Pentagon could help its excessive cost in spare parts just by tightening up its paperwork octopus on supply lists. Spares are cross-referenced in military and Federal supply lists a half dozen different ways. The indexing over-kill only runs up costs needlessly.

The military's penchant for changing system designs also throws spare parts logistics into a tailspin. Even the smallest design change can surge through the Pentagon's global supply network like a tidal wave -- forcing stock lists to be changed at thousands of supply points. Just curbing the flood of Government ordered design changes could help.

But the military services are reacting as one might expect. Rather than fighting for more money for spares, project people are pushing for nearly supernatural reliability levels on equipment. If gear has an infite mean-time-between-failure (MTBF), fewer spares are needed.

But Himalayan-high reliability specs are expensive to scale. It might be less costly in the long run to strike a compromise: Push for realistic MTBF specs, but at the same time don't short-change spares.

Those who try to drive cross-country without a spare tire often end up walking.

EDITOR'S NOTE: This objective comment on the current shortage of radio spare parts is also pertinent to Canada because many of our sets are of US manufacture and require US spares back-up.

CFHQ is fully conversant with all aspects of the controversy and is doing all possible to rectify the problem insofar as it concerns the Canadian Armed Forces.

SUCCESS STORY

From The Tower Times, Jan 29,1970

Lt L.R. Kalyniuk joined the Canadian Army in March, 1957 as a Craftsman in RCEME. After completing his initial training courses at The RCEME School he was posted to Camp Petawawa where he served on Brigade inspections and repair of field radio equipments.

In November, 1960 he was posted to Camp Borden to the Joint Nuclear Biological Chemical Warfare School and was promoted to the rank of Corporal. While there he instructed in Nuclear, Biological and Chemical subjects and also maintained the Radiac equipment used by the school.

Lt Kalyniuk attended the Master Radio Technician course at The RCEME School as a Cpl. On completion of this course in June, 1966 he was promoted to the rank of Sergeant. While holding this rank he instructed on both the former RC SIGS and RCEME Group 4 Radio Technician courses, on the Group 3 Radio Technician courses and on the new VRC family of radio sets.

Still in The RCEME School, Lt Kalyniuk was promoted to the rank of WO in April, 1967 and was then employed as the NCO IC electronic equipment maintenance. When CFSCLOE was formed in February, 1969 Lt Kalyniuk joined the integrated Electronic Coy and instructed on the new AN/GRC 106 Radio Set.

In April, 1969 Lt Kalyniuk was promoted to the rank of MWO and played a key role in successfully reorganizing a now large electronic maintenance organization to cater to ever increasing demands caused by rapid advances in electronic technology.

Recommended for commissioning from the ranks, Lt Kalyniuk successfully completed the CFR orientation course in Esquimalt, and was commissioned as a Lieutenant on December 8th, 1969. He is now attending the CELE Officer CFR course at CFSCLOE.

Cpl to Lt in three and one half years without missing any rank except CWO!! This HAS to be a record.

Lt. L.R. "Kal" Kalyniuk

LAND ENGINEERING TEST ESTABLISHMENT

By LCol J Adams

To support the Engineering Directorates of CTS Branch/CFHQ, a number of Engineering Test Establishments are maintained throughout Canada. One of them, the Land Engineering Test Establishment (LETE), is located three miles east of Ottawa , near Orleans, with detachments at the National Research Council facility - Ottawa, at CFB Uplands, and at the Defence Research Establishment, Ottawa.

LETE is divided into five sections:

a. Headquarters/ Admin Section
b. Test Section
c. Electronic Section
d. Support Section
e. Accounts and Stores Section

Test Section is composed of soldiers from seven corps and a number of civilians. The section is divided into the following sub-sections:

a. Instrumentation and Photography - responsible for instrumenting tests to extract engineering data by mechanical and electronic means, and often to record the results on multi-channel recorders. Photography records the testing results, using all standard methods of photography and high or low speed movie and micro or macro techniques.
b. Environmental and Durability Laboratory - tests components and sub-assemblies in such environments as temperature, humidity, corrosive atmospheres, altitude, etc in environmental chambers; and for durability on shock, vibration, bounce, drop, etc machines.
c. Mechanical Test - includes testing of all types of vehicles, weapons, personal equipment and special vehicle kits, at any stage from concept models to initial production samples.
d. Mobile Support Equipment - tests all ground equipment used to support airfield operations.
e. Electrical and Electronic - tests radios and electronic equipment under both laboratory and simulated field conditions.
f. Physiological Test sub-section is employed by Defence Research Establishment (Ottawa) as test subjects to study the effects of environment and external agents on service men.

Electronic Section is not involved in the direct testing of equipment, but rather in the design, development, failure analysis and modification of electronic equipment. As well, this section designs vehicle installations, details equipment modifications, evaluates and verifys the accuracy of instrumentation, and conducts laboratory testing to maintain state of the art techniques. This section is composed mainly of civilians and is divided into three sub-sections:

a. Communications and Electronic Engineering.
b. Vehicle Communications and Electronic System Installation.
c. Instrumentation.

Support Section maintains a workshop at each of the Orleans and NRC sites. Both workshops have machine, welding, sheet metal and plastic shops; while the NRC site has a printed circuit shop and the Orleans site has a vehicle workshop and carpenter shop. This section supports the other sections of LETE in testing and development; and CFHQ Directorates by fabricating modifications, parts, constructing mock-up installations, maintaining equipment under test, producing prototypes and, on occasion, producing small lots of equipment which can be most economically completed within these workshops.

Accounts and Stores Section provides the functions of Quartermaster for all of LETE, technical stores provision for some CFHQ Engineering Directorates, warehousing of a large array of special stores and reference equipment.

Enough of the organization, now let us look at a typical LETE test. Testing is based on an Engineering Test Instruction (ETI), issued by a CFHQ Engineering Directorate, usually after consultation with LETE personnel and reference to Military Standards and Operational Equipment Requirements.

To replace the M37, 3/4 ton family of vehicles, which are fast nearing the end of their useful lives, the Land Forces need a new vehicle. Once the operational troops issue an equipment requirement, the Engineering Directorate concerned searches the market for a truck which should meet that requirement. In this case, since none was commercially available, a contract was let to Chrysler Canada to engineer a vehicle which

would meet the requirement and to produce six prototype vehicles for testing.

An ETI was then raised by the Directorate of Vehicle and Fighting Equipment (DVFE) for LETE to test these prototypes. Testing of these vehicles is designed to ensure the vehicle meets the engineering characteristics and performance, endurance, maintainability and suitability for the Land Force requirement.

The engineering characteristics and performance of the vehicles are tested by two methods - practically, on test courses and by instrumentation. These tests include such things as maximum and minimum speed, acceleration with various loads, braking distances, turning radius, draw-bar pull at the pintle, gradability, suppression characteristics, side slope performance, cruising range and fuel consumption over various surfaces, winch capability, lighting, swimming characteristics, temperatures of all heat generating components. These tests are conducted in normal summer or fall type weather while the test tracks are in their designed condition; as a result, nearly all testing must be conducted again in the winter and in desert type conditions. Many of these, however, can be conducted in cold or heat chambers. To speed testing, this technique has been used on these new vehicles.

After the basic engineering testing is completed, reliability and endurance testing begins.

Now is the time for the whole range of test courses of the proving grounds to be used. These include a highspeed course, a gravel figure-eight, secondary roads, cross -country tracks, hard rock twist courses, and specially prepared Belgian Block, granite block and sine wave courses. A selection of courses was made so that the desired percentage of each condition would be traversed in each circuit and three shift driving began. Drivers drive all vehicles, attempting to hold very accurately to set speeds and timings so that results are as consistent as possible. Regular inspection halts are called and any defects are noted and corrected. As much vehicle data as possible is gained during this period, and includes quantitative figures such as consumption of fuels, lubricants, failures, parts mortality, running time, average speeds, wear rates, and general vehicle aging.

During the whole period of testing, LETE co-operates with the Directorate of Maintenance (DOM) by collecting as much data as possible to assist in the maintenance evaluation of the vehicle. Time to complete tasks, frequency of failures, aging rates, tools and special tools required, techniques learned the hard way, and errors or omissions in the vehicle literature are the kinds of information of interest to the maintenance directorate.

Finally, after the test team has completed all the required tests of the ETI, a report is written which assists the Engineering and Operational Directorate to decide upon the acceptability of the vehicle for field force use.

While this has been a quick resume of a vehicle test, a great range of testing other than vehicles is also conducted in LETE. To name a few - life preservers (yoke type), smoke grenade dischargers, SS11 on M113, vehicle storage covers, snowmobiles, navaid, radios, airfield ice clearance chemicals, rotary brooms, and ice formation in water trailers.

Life at LETE is varied and always interesting. Routine is almost unheard of and each day means a new challenge and an opportunity to see new concepts and equipment through their development stages.

Continued from Page 13

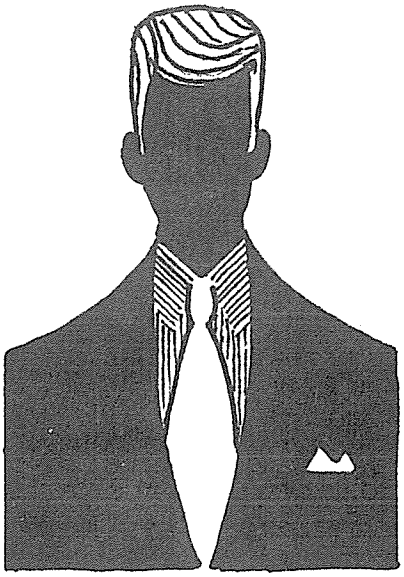
DESIGN NO 4

END

THE VALUE OF VALUE ENGINEERING

WANTED -

Old-Fashioned
Entrepreneurs



Reprinted from

ARMED FORCES MANAGEMENT
December 1969

Value engineers in the US Department of Defence are holding open two places of honour in their unofficial Hall of Fame. To fill these spots is not going to be an easy task, but to budget-constrained DOD, winners are badly needed.

One will go to the individual who can compute in dollars the worth of value engineering improvements that increase combat capability.

The other will go to the ingenious individual who concocts a means of turning conservative defence industry managers into swinging entrepreneurs.

Somewhat buried in Defence's Cost Reduction Program annual report for Fiscal Year 1969 was the total of $342.2 million savings credited to value engineering efforts. The Defence Department's top managers claim a $1.1 billion return during the six years the program has been in operation.

Now they want to set their sights higher in the quest to eliminate "gold plating", while obtaining the best product at the lowest cost. The two most nagging roadblocks can be short-titled: "military worth" and "entrepreneurship".

The first problem is internal and involves a very serious confrontation between value engineers and the research and engineering factions. It is a result of the growth of the value engineering involvement in the life cycle of weapon system development. In the past, value engineering has focused primarily on the production phase. Now it is looking at other applications.

The second problem is how to induce cautious defence industry leaders to participate vigorously in the value engineering incentive programs offered in defence contracts. This problem has been present from the very beginning of the Department of Defence program that got underway in 1963.

"Military worth" is the term used by DOD to express the additional combat capability resulting from value engineering changes. These are improvements that provide more reliability, easier maintainability and better performance.

According to the office of Assistant Secretary of Defence (Installations and Logistics), these improvements will receive great stress in the future, along with dollar savings from cost reductions. The job would be much easier if the value engineering effects on military worth could be logged in tangible dollar figures.

As for the monumental problem of trying

to stimulate industry to explore more actively the value engineering possibilities for greater profit, it is a matter of continued emphasis on education to foster understanding and increase motivation. This is diagnosed as the key ingredient that will put a tiger in the professional manager's tank.

Some 265 authorized value engineers in the Department of Defence are hard at work trying to solve these two broad trouble areas.

Through in-house and American Ordnance Association (AOA) surveys, value engineers have been able to prove to their own satisfaction that value engineering changes haven't degraded combat capability and, in some instances, have brought improvements. This, they contend, is increasing the military worth.

These surveys have proven invaluable at this particular time when the sometimes evangelistic VE practitioners are planning to carry their gospel deeper into the life cycle of the acquisition process, from initial development through disposal. This means reaching further into the heretofore hallowed cloisters where designers dwell.

Designers are wary of statements like- "We might roughly say that value engineering is to the design process what industrial engineering is to the manufacturing process", but value engineers are dogged in their determination to get the best for less.

The Director of Value Engineering qualifies as a strong ally of the designer. He states, "It's time someone started defending the poor designer. Management must give him the tools to design economically. And even if the initial design is perfect there will always be a need for value engineering because of new techniques and materials that weren't available at the time of the original design."

But to the majority of designers and engineers a value engineering proposal says in effect: "You didn't design it right the first time." This is the attitude that must be overcome. There is also the problem of resistance from the operating forces, who are more concerned, understandably, with reliability than with cost reduction savings.

It was the Director of Defence Research and Engineering who seemed to speak for both of these broad segments of the defence community in a February memorandum:

"I have reason to be concerned that value engineering has a powerful potential for reducing reliability. Although VE change proposals include consideration of reliability requirements, the major emphasis of the VE concept is on cost reduction...."

"I realize that you have recognized the possibility of undesirable side effects from value engineering, as evidenced by high-level supervision of the program and by studies you have made. None of these studies we have seen, however, including the American Ordnance Association report 'Total Value Engineering Effectiveness' contain definite data comparing the 'before and after VE change' reliability and performance demonstrated by systems or equipments during actual service use.

"Such data is the most meaningful, and should be available from the reporting systems now used by logistics activities. I believe that an analysis of in-service reliability experience on VE-changed equipment is necessary for determining if modification of our value engineering or reliability programs is warranted."

This challenge was thrown when the value engineering professionals felt they had reached a growth point and would start making significantly more dollar savings. Proof had to be provided before VE concepts would be able to influence the design phase.

This request for a study was agreed to and some 550 items that had been changed by value engineering actions were earmarked as suitable case studies. In a random selection process, 152 were selected and examined for the effect on reliability and performance. The results, published in a Sept report, showed:

- In 34 cases reliability and performance improved.
- In 107 cases there was no adverse effect.
- In 11 cases where failures indicated a potential for decreased reliability and performance, detailed review proved that in none of the cases was there a degradation.

While this report and the AOA reports are convincing to value engineers, the conversion of designers to the value engineering cult still has a long way to go. As was recently indicated: "Just as the need to eliminate unnecessary costs in manufacturing requires a formal program, so also does the need to eliminate unnecessary costs in design require a formal management approach -- VE can help fill this need."

However, telling it to the designers is somewhat like telling it to the Marines.

The same is true with regard to stimulating industry managers to full involvement. The real problem on both sides of the

fence is lack of understanding and motivation.

One of the things that often plagues the program is lip service. Probably only the passage of time will overcome some of the ingrained psychological barriers.

Pushing the pace of time is SAVE -- the Society of American Value Engineers, a 3,000 member organization that traces its genealogy from World War II. A charter member of the society states that both internally and in industry "management must change its attitude towards its own people."

The suitability of the VE incentive clauses in defence contracts obviously is a key factor in determining the amount of investment that a contractor will make in value engineering work. In the case (such as development contracts) where the government funds contractor value engineering efforts, the results are impressive. But when non-government funded VE efforts are proposed there is a noticeable reluctance to risk capital without some assurance that the buyer (the government) will accept the proposal. If the buyer does, the return to the contractor on the savings can amount to as much as 75 percent of the total saved.

Naturally, the value engineers would like to have something that would allow the office of the Secretary of Defence to quantify in dollars the improvements in combat capability resulting from value engineering changes. It would help convince the designer and ease the way into the development phase of weapons systems acquisition.

But most of all there is the need to get industry to exploit fully the opportunities inherent in the incentive clauses.

Why the foot-dragging? Some bluntly lay the problem to the recent ascendancy of the professional manager to the top jobs. The present defence contract clauses are tailored for the contractor who will take some risk for high gain and professional managers are, by nature, basically conservative.

Thus it seems that the real problem is that vanishing American -- the old-fashioned entrepreneur.

The Department of Defence wants him and is offering the incentives to prove it.

Where is he?

PRODUCING THE "NEW" TRADESMAN

By CAPT WW LAIRD

Standards Company, CFSCLOE

There has been a lot of talk and many, many questions have been asked concerning the new Canadian Forces Training System (CFTS). If this is new, how does it differ from the old? What sort of tradesman are we getting? What can they do? Are they better than before? When will all this be ready? How does this affect promotion, careers?

Although it would be difficult to shed light on all the queries, I hope, in this article, to answer as many as possible by explaining what has been done to date.

I'm sure anyone who has served with maintenance units would not condemn our old system. It produced some very excellent tradesmen and some very efficient teams. But, in the last few months a new breed of tradesman has been showing up. Different methods of upgrading and different qualifications have been introduced. We now have level 3 tradesmen and level 4 OJTS. Some units have already completed "validation" questionnaires. Just how did this transpire?

Let's say it began some time ago when integration of the forces offered a golden opportunity to revise training to a 'systems' approach, that is, the identification of performance objectives, the best methods of achieving the objective and a means of measuring the result against a stated standard. A Canadian Forces Training Systems Manual (CFP 9000) was prepared and it describes the processes, steps, and documents required by the CFTS. Figure 1-1 of CFP 9000 is shown on the following page. From this chart can be seen the system processes, steps and products and how they are related to each other as the system develops.

CFP 9000 introduced some new terms. For instance: Performance Objective (PO) - a statement which describes what the tradesman can 'do' on completion of training; Course Training Standard (CTS) - a document controlled by Training Command which contains all the PO's for a particular course, also On Job

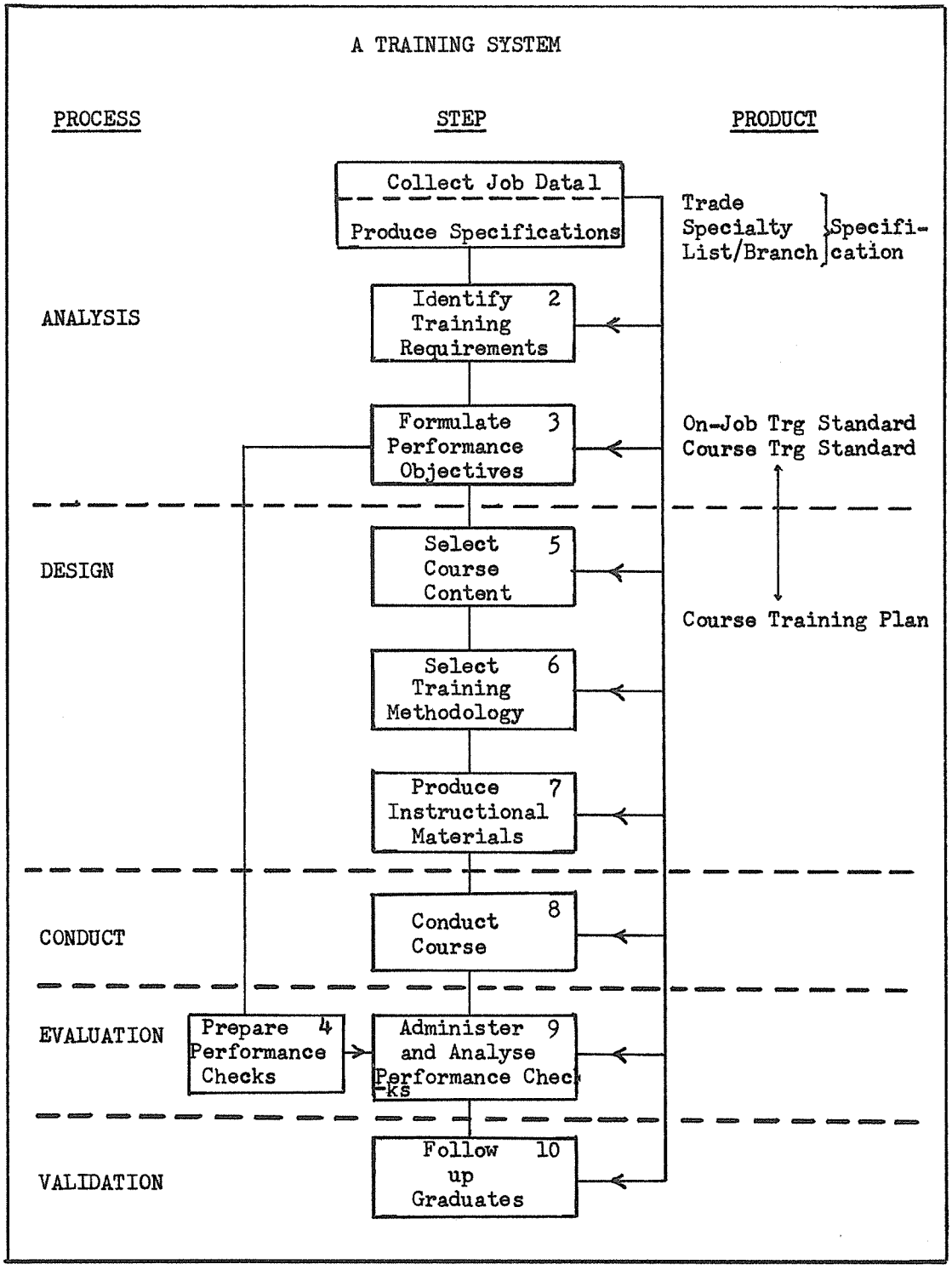
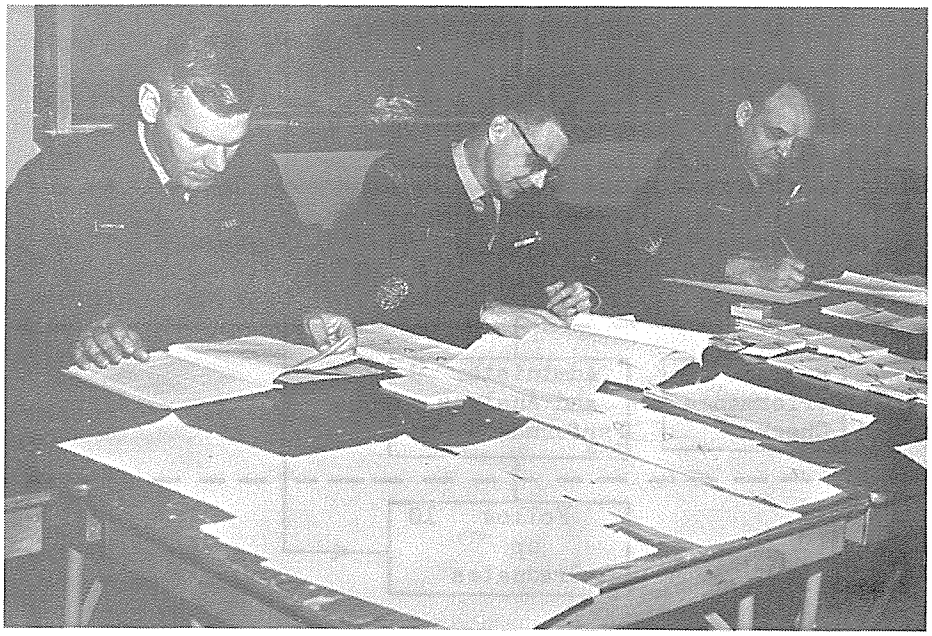


Figure 1-1 A Training System

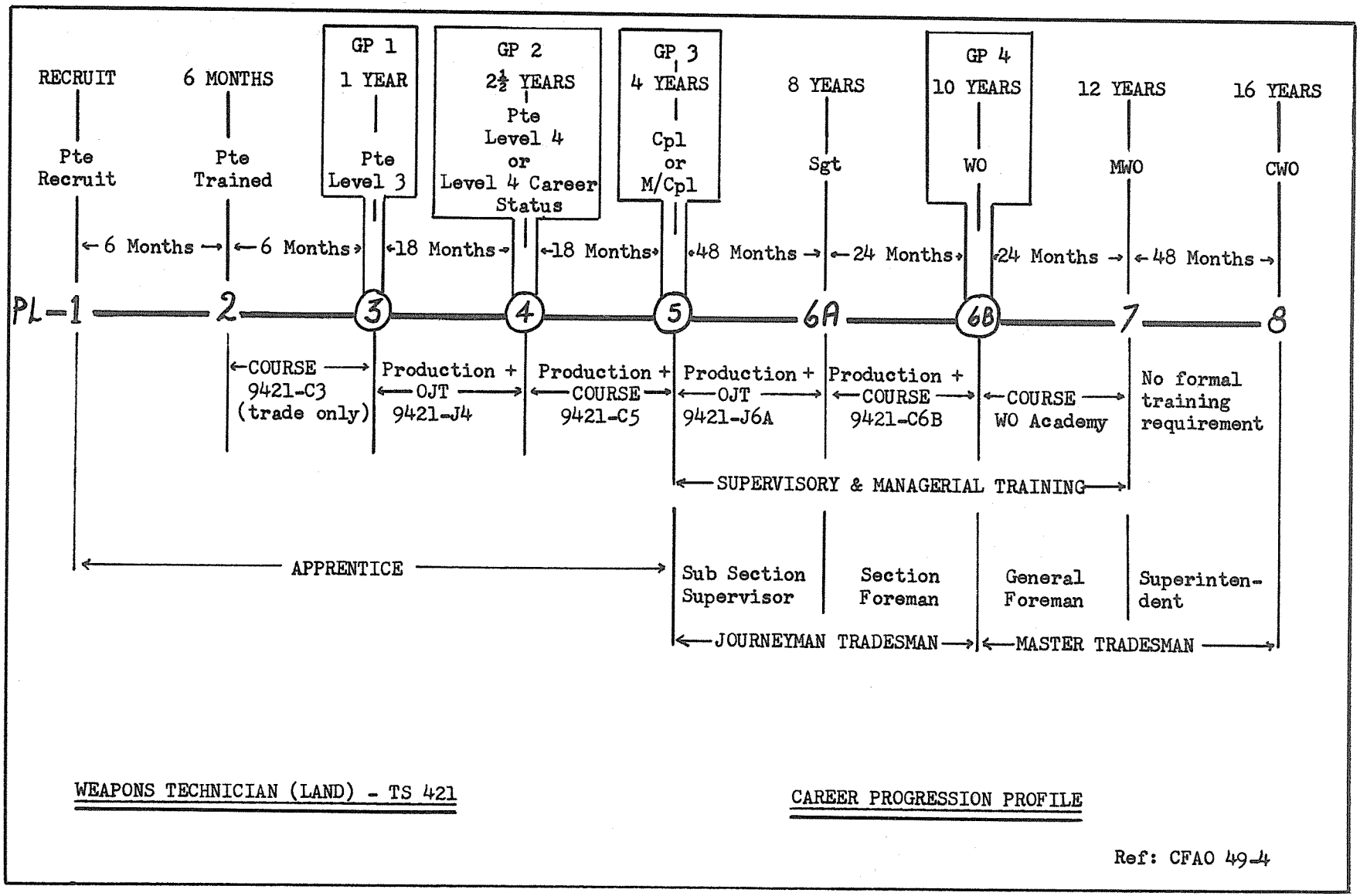
Training Standard (OJTS), Enabling Objective - a statement of skill or knowledge related to a PO which describes the skills and knowledges which must be taught to 'enable' a trainee to perform a PO, Course Training Plan (CTP) - a document controlled by a school in which each PO with its related EO's is recorded, Standards Company - a new group of harrassed individuals who do their best to produce CFTS documents.

So, the question of how standards personnel approach the new concepts and methods must be answered. There were many facets to consider. Firstly, two very important interests had to be served. The "Service" should have tradesmen who can "do" as much as possible with as little training as possible in as short a time as possible. Then, the serviceman or woman ought to be taught to "do" these things as soon as possible in his or her career and at the same time be provided with goals for steady and unimpeded advancement according to his or her capability and desire. We prepared a Career Progression Profile based on CFAO 49.4. This profile appears on the following page. From this you can see the old group system, the new level system and the related civilian status of each, measured in time and rank with the level of training standard to be achieved.

The key to the training concept is "do". The tradesman must be trained to do the things that are normally demanded of him on his job. So naturally - the first stage was to compile a list of tasks, including all the tasks regardless of their nature, performed from the lowest to the highest level. We then divided the tasks within the levels. Here we considered the Permissive Repair Schedules, normal practices and, of course, the sharing of the workload according to the complexity of the task. You might regard this stage as a task analysis based on skills. We then prepared PO statements for each level, allocating to each PO the skills that were reflected and for which training was indicated. At this point it might be wise to enlarge on what a PO really represents and how it is justified. We know that it reflects what the tradesman must "do" but in addition, if we are to measure the performance, it must also have a distinctive beginning and ending. It must state the scope accurately with one action verb. It must set out the conditions which could affect the performance and also the standard at which the performance is recognized as adequate or acceptable.



Members of CTS Team 431 El M Tech, at work on one of the many Training Standards.
L to R - WO LW Thompson, MWO HE Blackmore, WO IJ Kroeker



WEAPONS TECHNICIAN (LAND) - TS 421

CAREER PROGRESSION PROFILE

Ref: CFAO 49-4

This is a typical profile for all mechanical trades. All training is a prerequisite to the trade level and rank shown.

Ensuring accuracy of input to the Course Training Plan, WO AL Ross checks a reference with Cpl JP Griffith, Sgt GB Stanley and WO AR Slaughter - all members of the CTP Team 421 Wpns Tech (L) PL 5

When the PO's for each level were prepared they were then sequenced to form Chapter 4 of the CTS, the document which is then prepared and authorized by Training Command HQ in the form of a Canadian Forces Publication (CFP), e.g., Weapons Tech (L) Level 5 is CFP 9421C5.

Having an authorized CTS, it was then possible to prepare a CTP. This was done by utilizing the same skill list used for the preparation of PO's and analyzing each skill for the knowledge requirement based once more on the level, that is, the higher the level the more detailed the knowledge requirement became. Then, the more enlarged and complex list under each PO was combined into a number of EO's, which are basically the same as a PO with one notable exception - they represent how the school intends to conduct the training. They may not necessarily reflect what a tradesman must "do" on the job but rather, the calculated technique, method and procedure which will bring him to the standard predetermined by the PO. The CTP, then, became the document to control training content down to the instructor level.

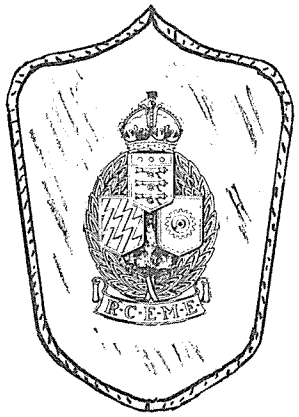
From the wide variety of systems and equipments which this highly mechanized force must maintain, it was necessary to choose representative ones on which the tradesman could be taught performance requirements or on which measure of performance could be checked. This served to streamline course content and reduce training time. This means that generally speaking, at level 3, the tradesman is taught to operate, service, remove and replace components and make the running adjustments necessary to keep the equipment in operating order. At this point he is trained to job entry level and is, in fact, an apprentice. Of necessity, the degree of supervision must be high. Not only that, his supervisor must ensure he receives guidance on the equipments with which he has had no experience. According to the OJTS he then progresses to level 4. Theoretical knowledge is limited, but at this point he is a fairly competent and versatile tradesman who can accomplish the great majority of permissive repairs up to field level and, with minimum supervision, he should be able to carry his load as a serviceman under field conditions.

At level 5, in keeping with the progression profile, he reaches journeyman status and is promoted to the rank of Cpl. The training then prepares him to carry out all but the most complex or seldom required repairs.

By increasing the knowledge content of his training he is prepared to inspect, to make repair decisions by relating his observations to the standards set out by the manufacturer, to organize work for small groups, and to supervise tradesmen in trade duties or under field conditions. He is now committed to a Service career and hopefully to higher levels of trade and leadership.

At this writing, levels 6A and 6B are in the preparation stage. Future articles will outline the preparation of these and reveal more of the detail of the training plans (CTP's) for specific mechanical trades.

DO YOU HAVE ONE?



The RCEME Museum is most anxious to acquire a wooden wall plaque bearing the old RCEME badge, similar to the one shown above.

We understand that for a number of years one such as this was displayed in the RCEME School Officers' Mess. Like so many other things, with the passing of years and changes in personnel, no one is now quite sure where it went or what happened to it.

It is likely that many RCEME units, both Regular and Militia, possessed such a plaque. If so, what better fate could befall it than to be given a place of honour in the Corps Museum?

If you have a plaque, or know where one can be located, would you please write to The Curator, The RCEME Museum, CFB Kingston, Kingston, Ontario.

REDUCTION IN MILITIA

On 19 December 1969 The Hon. Leo Cadieux, Minister of National Defence, released a statement announcing that the militia will be reduced by approximately 4,000 over the next year. The number of major militia units will be reduced from 96 to 87; and the number of minor units from 138 to 78.

The reductions, together with a number of organizational changes, are being made to reflect Canada's redefined military roles and defence budget restrictions. To complement and more closely support regular force operational roles, most militia units will be placed under Mobile Command effective 1 April 1970.

In addition to the reductions in militia strength, the regular force supporting staff establishment for all reserve forces will drop from approximately 1,300 all ranks to 650.

Prior to the Minister's announcement, a total of twenty RCEME Technical Squadrons were located across Canada. As a result of the announced reductions, only eight of the Technical Squadrons remain. They are:

20th Technical Squadron RCEME - HALIFAX, NS

21st Technical Squadron RCEME - MONCTON, NB

42nd Technical Squadron RCEME - QUEBEC, BC

45th Technical Squadron RCEME - TORONTO, Ont

47th Technical Squadron RCEME - HAMILTON, Ont

39th Technical Squadron RCEME - WINDSOR, Ont

38th Technical Squadron RCEME - EDMONTON, Alta

49th Technical Squadron RCEME - VANCOUVER, BC

Although the number of supporting service units are substantially reduced, the service units will continue to be represented in district headquarters locations at section or platoon level within the service battalions. This would indicate that in Montreal, for example, a RCEME section or platoon will form part of a Montreal Service Battalion as opposed to the two Technical Squadrons previously located in that city.

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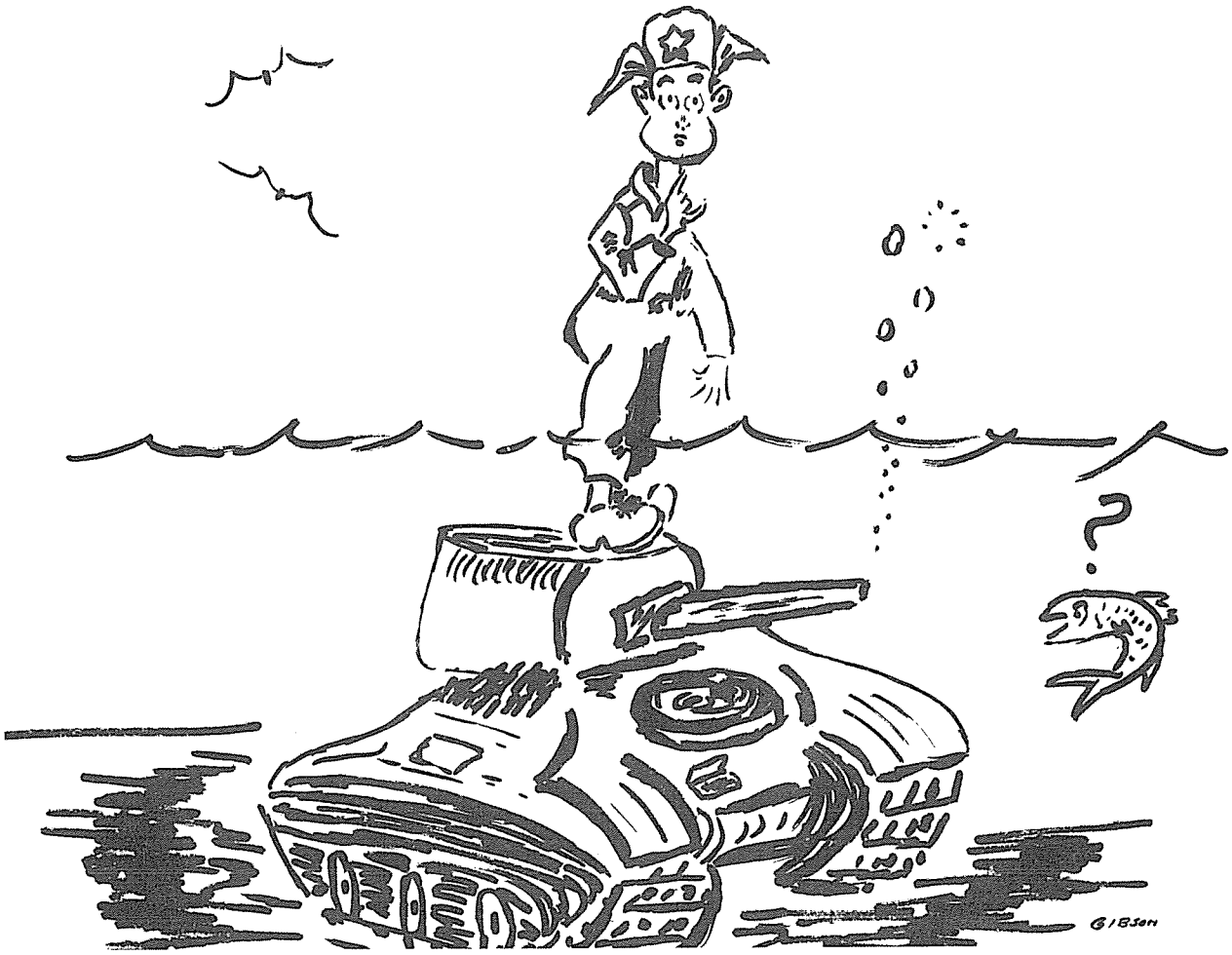
COMMENTS ON ARMORED AMPHIBIANS



The following is a translation of a Russian article on armored amphibians written by a Soviet soldier. The article was sent in by Major CR Morgan, Canadian Forces Liaison Officer at Detroit Arsenal, USA. Although the content may not be of much value, the quaintness and simplicity of style should prove interesting to those who have considered submitting material for publication but hesitated because they felt lacking in the ability to write.

-- Editor

Soon summer will be here. Once again the grass will part and water rush under my armored reconnaissance vehicle. Right now we must prepare it for its long trips.

I always begin this work by checking assemblies and tanks which need greasing. If necessary I fill them up. Then I inspect all remaining assemblies and components.

I pay particular attention to the braking system. In case of necessity I add fluid to the master brake cylinders. Once the brakes failed on Pvt Tomin. Fortunately, this occurred on flat ground and at a relatively low speed. The reason was a simple one: fluid had leaked out of the cylinder for the right front wheel.

Inspecting the water-jet engine I check to see how the baffle opens and closes. Then I see whether there are leaks from the water-jet drive casing, and whether there is enough oil. I check the cables carefully. Pvt Korvanyy was driving once when

the baffle would not open fully due to weak cable tension.

In crossing rivers, before the vehicle enters the water, I always check to see how solidly the plugs are in the bottom of the vehicle and whether or not the water drain is closed.

Sometimes inexperienced drivers forget to raise the wave shield and put 1.0-0.75 kg/cm^2 in the tires. The first error is immediately obvious in the water -- water begins to pour into the vehicle. The second is more complicated. Some people are surprised: why did their vehicle get stuck at the bank when the others had no problem at all? The fact is that with higher pressure in the tires their traction surface is reduced and thus the force of traction is poorer.

I enter the water in first or second gear, opening the water-jet engine baffle and switching it on. The speed should not exceed 10-12 km/hr. As soon as the vehicle touches the water I shift the gear lever into neutral. In the water I immediately look to see whether there are any leaks. Pvt Dzyatko once forgot to close the water drain valve, and he did not notice the water immediately. The exercise had to be terminated, and if the shore had been further off the outcome might have been worse.

Under wind conditions I try to hold the vehicle into the waves and to go at maximum speed -- this guarantees maximum maneuverability. Before a large wave I reduce speed to soften the impact. If the viewports are unusable due to spray, I conduct observations through the periscope contained in the view instrument package.

Water turns present some difficulty for inexperienced drivers. Amphibious vehicles should be turned with the front wheels just as on dry land. But one should bear in mind that in water the turn is somewhat delayed. For a sharp turn I throttle down and close the water-jet engine baffle, then move the baffle control lever forward for a right turn and back for a left turn, increasing engine speed.

Once I drove my vehicle through an old river bed covered by water plants and mud. They clogged the grating of the intake sleeve on the water-jet engine..In order to clean it out I switched to reverse for two or three minutes in the drive selection box. Once our vehicle came onto a shallow spot and the wheels touched solidly, it was impossible to move the vehicle using only the water-jet engine. I tried both axles, but that did not help. I tried to shake the vehicle loose, switching on forward and reverse alternately. For reverse I throttled back and closed the water-jet engine baffle, then moved the baffle lever to full front position. After three or four minutes the vehicle disengaged itself.

For leaving the water I usually choose a gently sloping bank with solid ground, without rocks or snags. Last summer I had difficulty bringing the vehicle on shore across a silty bottom -- the wheels stuck and skidded. Now I shall attempt not to repeat such a mistake. A sticky bottom can be determined by lack of current and presence of water plants.

I try to direct the vehicle perpendicular to the shore line -- this reduces the possibility of sudden slips and wheel skids. Approaching the bank, it does not hurt to pick out ahead of time a tree or stump which in case of necessity can be used to anchor the winch cable. Experience has shown that one should not stop until the wheels are completely out on solid ground.

After completion of an exercise the vehicle should be carefully inspected and serviced. Once Pvt Subochev did not notice oil leaks. It is a good thing this was caught at the check point. Otherwise this would have caused the crankshaft bearings to burn up.

I check particularly carefully the steering wheel clearance, the pins of the steering gear stays, brake operation, as well as any condition of the springs and shock absorbers. Finally I grease everything that needs it.

* * * * * * * * * *

HOW WELL DO YOU SPELL?

Read the following sentence to a friend and ask him to write it down. From 100, which is a perfect score for the test, subtract 10 for each word spelled incorrectly:

Outside a cemetery sat a harassed cobbler and an embarrassed oculist, picnicking on a desiccated apple, and gazing at the symmetry of a lady's ankle with unparalleled ecstasy.

CWO J.L. MERCER RETIRES

When CWO J.L. Mercer joined in the singing of "Auld Lang Syne" last New Year's Eve, it held a special meaning for him. The following day, 1 Jan 70, he would be commencing retirement leave after thirty years of continuous service, having started his Army career in Kingston on 19 November 1939.

During WW 2, CWO Mercer served overseas with the 1st Canadian Base Ordnance Workshop and the 2nd Canadian Tank Troop Workshop. The latter unit played an important role in the Falaise Gap campaign. Assigned the task of converting a number of self propelled vehicles into Troop Carriers, the unit worked day and night to complete the job ahead of schedule.

Following his return to Canada in September 1945, CWO Mercer was posted to Suffield, Alberta and later served at Vancouver, Picton and Kingston. Since 1961 he has been employed as Adm Officer of Apprentice Training Company, The RCEME School, and Adm Officer of Armament Company (now 'C' Company, CFSCME).

On 9 January 1970, CWO Mercer was "mugged out" of The CFB Kingston Sergeants' Mess (McNaughton) with good wishes for a happy retirement from all the members. Also, in appreciation of his many years of service, CWO Mercer was presented with a hand-crafted silver plated cigarette case by Colonel A.L. Maclean, Base Commander, CFB Kingston.

In the above photo CWO Mercer is shown spending a few relaxed moments with four other RCEME Chief Warrant Officers with whom he has served the last few years. Among them, these five CWOs have a combined service of 145 years. They are, left to right, CWO JL Mercer (30 years), CWO J Szumlanski (28 years), CWO ME Guilfoyle (29 years), CWO TH Dodds (31 years) and CWO DN Campbell (27 years).

* * * * * * * * *

REPORT ON THE RCEME (CA(R)) CORPS OFFICERS' FUND

The RCEME Corps Officers' Fund was established in 1955 by the then DEME, Colonel J.R. Dunlop, to provide a general fund for the financing of any project which would benefit the Corps as a whole.

Initially, all serving officers of the Corps of RCEME (Canadian Army (Regular)) were members of the Fund and paid an annual subscription to the Fund. At the meeting of the Fund Executive Committee in Jan 68 it was decided, because of the uncertainty of the future of the Corps structure, that no more subscriptions would be collected until further notice and that no more members would be accepted into the Fund after 31 Jan 68.

As a result of these decisions, the Fund has a decreasing bank account (some commitments continue) and a decreasing membership (because of retirements and releases). The Fund membership now comprises all serving RCEME officers of the rank of captain and above (including colonels and generals) and all lieutenants whose date of seniority is prior to 31 Jan 68. In CFP 224 Canadian Forces Officers' List (Regular) dated 17 Mar 69, this includes all lieutenants down to and including Lt C.E. McClafferty. No other officers will become members of the Fund until the Executive Committee decides on the future form the Fund should take. This will probably depend on the new officer classification structure of the forces.

The F and E belonging to the Fund is valued at approximately $16,000 and includes mess silver and crystal, pictures, paintings and crests, the gun and sword collection and numerous gifts presented to us over the years. Since the closing of the RCEME School Officers' Mess on 14 Nov 69, some of the items have been moved to the CFB Kingston Officers' Mess (former RCS of S Officers' Mess). The gun and sword collection and the model gun are in the main entrance to Base HQ. Other items have been lent to the RCEME Museum. All this F and E will be protected. Its future use will be determined by the Fund Executive Committee when the situation stabilizes. Some items will be loaned to 202 Wksp Depot for display in the Longue Point Officers' Mess.

The Fund will also continue to provide annually:

a. dining out dinner and gift cigarette box to retiring members;

b. sword for the best subaltern EME graduate;

c. prize for the best ROTP Phase 2 officer cadet.

The Executive Committee of the Fund comprises the eight senior serving RCEME officers. At the present time, these are:

BGEN A. Mendelsohn
Col K.R. Ward
Col A.L. Maclean
Col W.J. Owens
Col A.M. Reid
Col G.W. Bruce
Col J.R. Boughton
LCol A.G.M. Maitland

The Administrative Committee of the Fund is as follows:

President Col A.L. Maclean
Secretary LCol A.G.M. Maitland
Treasurer Capt C.N. Sochasky

all of CFB Kingston.

All members of the Fund received the revised terms of reference for the Fund dated 15 Sep 69 under cover of explanatory letter 7331-0001/10 dated 19 Sep 69.

At the Executive Committee meeting held in Kingston 23 Jan 70, it was agreed to continue operation of the Fund in accordance with the decisions outlined above.

Any questions a member may have regarding the Fund should be addressed to the Secretary, LCol A.G.M. Maitland, Base Technical Services Officer, CFB Kingston.

LORE OFFICER CLASSIFICATION

In the Nov 69 issue we promised that as more detail became available concerning the LORE Officer Classification Specification, it would be passed on to our readers.

The following information on the Areas of Employment, Scope and Assumptions is from a recent presentation given to delegates at the LMM Study Period by LCol DJ Tidy, Chairman of the LORE Specification Writing Team.

The LORE Specification has been processed through CFHQ and, to the best of our knowledge, has been accepted.

ASSUMPTIONS

a. the land ordnance maintenance system is entirely within the military domain. Although a civilian staff is desirable, perhaps essential in some instances, the senior positions are military;

b. the land ordnance systems engineering aspects are mainly within the military domain. However a glance at the DCEng sub-branch organization chart shows some civilians at the DG and director level. Nevertheless, our specification assumes that there would be no competition between LORE officers and civilians for senior positions;

c. all LORE officers will be given post-entry training, to a common standard, in the maintenance engineering aspects;

d. all LORE officers will receive "awareness" training in the full life-cycle implications of equipment acquisition;

e. it is feasible to train all LORE officers to the level required to carry out the ammunition maintenance activity, thereby eliminating the possibility of restricted employment for specialists;

f. special training is required to qualify an officer for employment in Ordnance System engineering;

g. senior officers in the maintenance engineering appointments will require additional training in some management techniques;

h. officers employed outside the maintenance environment should be returned to it periodically;

j. some additional training will be necessary from time to time;

k. suitable screening/selection processes can be developed to determine who gets what sort of training and when;

m. there are no "list" qualifications for promotion.

LIST OF ORDNANCE SYSTEMS

Ordnance Systems include:

a. Combat vehicle systems.

b. Support vehicle systems.

c. Field Engineer Equipment.

d. Weapons including guided and unguided weapon systems of the field force.

e. Drone systems and elevated platforms of the field force.

f. Electrical and electro-mechanical equipment such as power generating sets, navigational aids, optical instruments and fire control devices.

g. Conventional ammunition, explosives and pyrotechnics.

h. Nuclear, biological and chemical warfare protective equipment for the field force.

j. Tools, test equipment, materials and processes used in maintenance or Ordnance Systems.

k. Ancillary equipment such as field cookers, pumps, water purification and welding equipment, and

m. for the purpose of repair and maintenance only, field force communications/electronics equipment. (See Note 1)

NOTE 1: Except in first line when this responsibility has been assigned to the respective user branch.

AREAS OF EMPLOYMENT

The principle areas of employment for LORE officers will be in the maintenance engineering and ordnance systems engineering fields. The maintenance engineering field encompasses the complete range of electronic, electrical, electro-mechanical, and mechanical equipments and ammunition found in those communications, weapons, mobility and auxiliary equipment systems classed as Ordnance Systems. These include: communications/ electronic equipment; combat and support vehicle systems; field engineer equipment; weapons, drone systems and elevated platforms; power generators; navigational aids; optical instruments; fire control devices; explosives and pyrotechnics; tools and test equipments; pumps; water purification equipment; welding equipment; field cookers and heaters; nuclear, biological and chemical warfare protective equipment; and miscellaneous ancillary equipments. The ordnance systems engineering field is concerned with all of the foregoing range of equipments less communications/ electronics equipment. Those officers qualified to work in the ordnance systems engineering field will rotate between appointments in maintenance organizations and systems engineering establishments. LORE officers will also be employed in the general fields of staff and command positions in the logistics system, and will be contenders for many of the senior appointments in the CTS Branch.

SCOPE

The Land Ordnance Engineer (LORE) manages all engineering activities associated with Ordnance Systems at all levels of command; his function forms an integral part of logistics*. These activities are extremely varied; they provide the engineering services essential to the acquisition and support of these systems throughout their entire life cycles, intimate support of the combat arms, and certain specialized support for other systems. Officers of this classification establish maintenance doctrine, and formulate and implement maintenance policies, plans and procedures. These officers determine the periodicity and levels of maintenance operations, prescribe the range and quantity of spare parts and ammunition components required to support maintenance activities at all levels, investigate equipment defects and maintenance problems, and specify maintenance accomodation and facility requirements. They develop the engineering techniques essential for the storage, movement, and operation of equipment under all environmental conditions. They prepare and promulgate technical instructions for Ordnance Systems, and safety regulations for explosives in all environments.

Land Ordnance Engineers advise commanders and staffs on organization and management of maintenance activities, on ease of maintenance and reliability requirements, and on equipment capabilities and limitations. Officers of this classification budget for and manage allocated maintenance resources including military and civilian personnel, money, and material. They command technical service units, support service units, and maintenance units and sub-units engaged in servicing, inspection, repair, recovery, overhaul, modification, conversion, reclamation and condemnation of Ordnance Systems. Land Ordnance Engineer officers participate in the formulation of plans, policies and qualitative requirements for the acquisition and use of Ordnance Systems. Officers of this classification manage the acquisition and introduction into service of Ordnance Systems. They design, develop, test, evaluate and prepare specifications for Ordnance Systems and associated tools and test equipment. They define requirements for and conduct appropriate classification and trades training.

* NOTE: CFP 125 (B) defines LOGISTICS as "those aspects of military operations which deal with: a. design and development, acquisition, storage, movement, distribution, maintenance, evacuation and disposition of material; ..."

ORIGINS OF MANAGEMENT

Reprinted from "PERSPECTIVE" - Oct 69
Directorate of Management Engineering, CFHQ

Approximate Year	Individual or Group	Major Managerial Contributions
5,000 B.C.	Sumerians	Use of script for record-keeping.
4,000	Egyptians	Recognized need for planning, organizing, and controlling.
2,700	Egyptians	Recognized need for honesty or fair play. Therapy interview - "get it off your chest".
2,600	Egyptians	Decentralization in organization.
2,000	Egyptians	Recognized need for written work in requests. Use of staff advice.
1,800	Hammurabi	Use of witnesses and writing for control; establishment of minimum wage; recognition that responsibility cannot be shifted.
1,600	Egyptians	Centralization in organization.
1,491	Hebrews (Moses and Jethro)	Concepts of organization, scalar principle, exception principle.
1,100	Chinese	Recognized need for organization, planning, directing, and controlling.
600	Nebuchadnezzar	Production control and wage incentives.
500	Mencius	Recognized need for systems and standards.
400	Socrates	Enunciation of universality of management.
400	Xenophon	Recognized management as a separate art.
	Cyrus	Recognized need for human relations. Use of motion study, layout, and materials handling.
350	Greeks	Scientific method applied. Use of work methods and tempo (worked to rhythm of music).
350	Plato	Principle of specialization enunciated.
325	Alexander the Great	Use of staff officers.
175	Cato	Use of job descriptions.
50	Varro	Use of job specifications.
20 A.D.	Jesus Christ	Unity of Command. Golden rule. Human relations.

REME TRAINS IN CANADA

Reprinted from "The Craftsman", November 1969

by Sgt D. Brown, REME
7 Sqn RCT Workshop REME, Tidworth, UK

During May, Sgt Dave Brown (myself), Lcpls Mick Adams, Jeff Wishart and Cfn Andy Winton, along with other members of 7 Squadron RCT left Tidworth for five weeks' training in Canada. After a one-hour aborted flight on the 19th, we took off on the 20th and made it at the second attempt to RCAF Namao, via Gander for a refuelling stop. From Namao we had a three-hour coach trip to Camp Wainwright, our base for the training. After a short night's rest, we paraded in the morning and with the other members of 5 Inf Bde minor units, were taken under the wing of 1 OFP RAOC and formed into a logistic company which, in turn, was attached to 1 Bn RGJ.

The first fortnight was spent carrying out infantry training in the vast training area of Camp Wainwright. What parts of our bodies that didn't ache from the unaccustomed roles we were carrying out were bitten red raw by mosquitoes. After a hectic fortnight, we left Camp Wainwright for a well-earned rest in Calgary where we were really shown excellent Canadian hospitality. From Calgary we left for Banff National Park which is situated in the Canadian Rockies, where we carried out adventure training. Jeff Wishart and Andy Winton drove direct to the base camp as they elected to go on the very fast-flowing and freezing cold mountain rivers in canoes. Mick Adams and myself went hiking which involved being debussed, approximately 30 miles from the base camp. We had to hike, along with others, 18 miles over very barren land with not a friendly soul to be seen, to an RV where we found assault pioneers of 1 Bn RGJ who ferried us in assault boats, 12 miles to the other end of Lake Minnewanka. From here we had another four-mile uphill slog to the camp. Once at the camp we carried out other hikes in the Rockies, with one free day to take in the sights of Banff. The views were tremendous as Banff is set among snow capped peaks of the Rocky Mountains.

After five days spent in Banff, we set off again for Camp Wainwright which was an 11-hour journey, not recommended at all in the back of a 'duece and a half'.

Once back at Camp Wainwright we took part in a three-day exercise involving 1 Bn RGJ and units of the Canadian Army. Whilst on this exercise we experienced the coldest June night since records have been kept. Water froze in water bottles and sleep was almost impossible. After the exercise we had time to catch up on sleep and unwind whilst we waited for the flight home, eventually arriving in Tidworth on 20 June.

PINCER MOVEMENT?

50 Years Ago: Madame Jacques, the inventor of a corset for men, has asked Surgeon General O'Reilly to take up the subject of introducing this article of wearing apparel in the Army. She claims that it is especially valuable for officers as they get on in years and become obese.

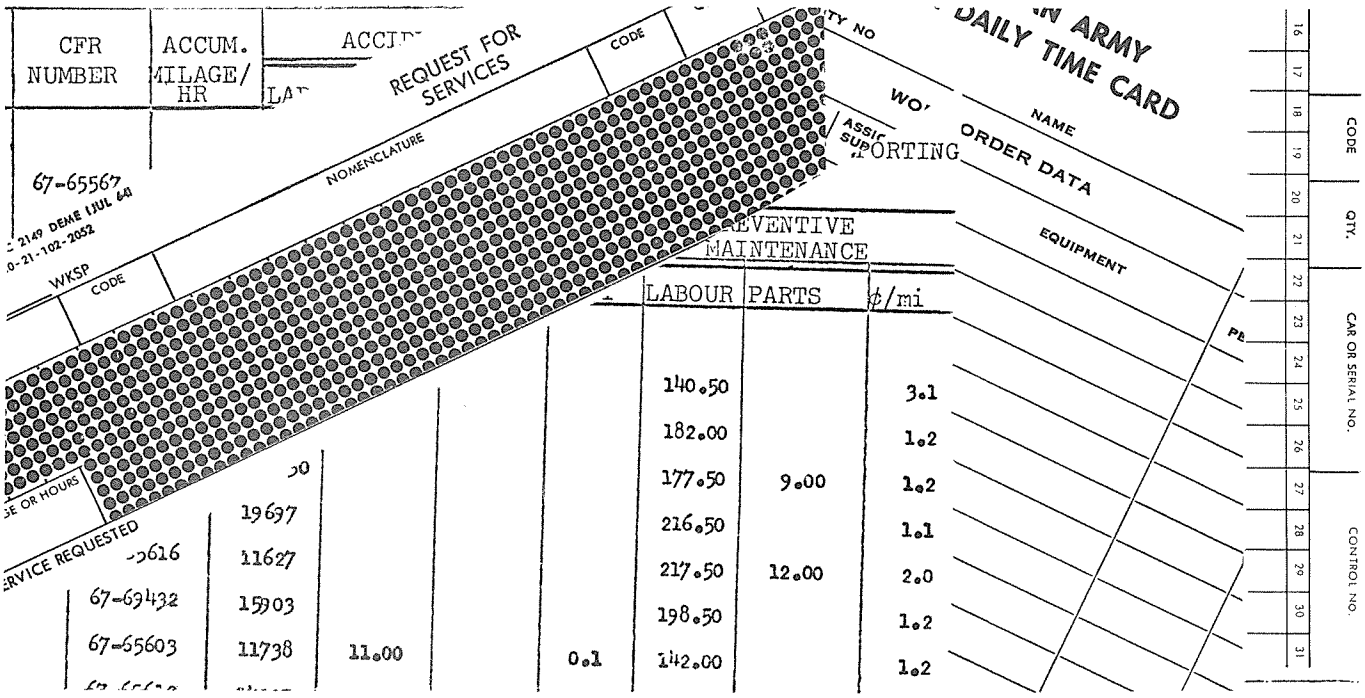
The Surgeon General is disinclined to give the matter serious consideration.

---- from the files of the "Army-Navy-Air Force Journal" (U.S.)

A good leader takes a little more than his share of the blame and a little less than his share of the credit.

THE LAND ORDNANCE REPAIR DATA SYSTEM

By Major C.R.M. Fillingham, REME



This new title, for what has been affectionately known as the '2149' system, marks the start of a new phase of development of this familiar system. A critical look has been taken at the existing system right from the basic source document to the final output reports. Other information feedback systems, such as the Monthly Time Return, have also been studied and all known and projected data requirements have been considered.

It was immediately apparent that the major task was going to be that of making the system more cost-effective whilst trying to reduce the recording load. One of the basic principles adopted in approaching the subject was the need to make the minimum number of changes, because this not only will save confusion and re-training but will also enable improvements to be adopted sooner.

Here are some of the changes that will be taking place over the next $2\frac{1}{2}$ years:

Supplementary Maintenance Data Trial - This will be restricted to four of the present fleets currently being recorded. The amount of data recording will be reduced. Eventually, the trial will be replaced by what will be known as "Category A recording". This will only be applied to new operational equipments as they enter the service and will be discontinued once the basic reliability factors of the equipment have been established. Coding used will be the same as for the trial, but with some simplification. "How Found", "How Failed","Maintenance Impact" and individual item parts cost recording will all be eliminated. The only new piece of information that will be recorded for Category A is whether the repairs being undertaken would have meant that the equipment could not have completed its mission. This will require some judgement because, for example, an 8-cylinder engine could probably function with 2 cylinders 'missing' but if 4 of the cylinders were not producing power, the vehicle would probably be unable to complete its mission.

The Daily Time Card - It has not been possible to eliminate this much maligned document but it will be possible to save a lot of the transferring of information from it. The Daily Time Card will be replaced by a Weekly Time Card (in duplicate) which will be kept in a wallet and filled in during the day by the tradesman or his supervisor.

Each evening it will be handed in and re-issued to the man the next day. If he is sick or absent for some reason, this will save the Control Officer calling in Sherlock Holmes to find the missing Time Card. At the end of the week the top copy will be retained by the workshop for local records and the bottom copy (probably on ' No Carbon Required' paper) will be sent to CFHQ(DOM 4). The computer will then be able to do all the cross recording and mathematics that now take so much time in so many workshops. To complete the picture, a monthly return of man-days available for each trade will also be required but this should prove no hardship to produce. Once this system is working it will be possible to eliminate trade recording from the 2149, to eliminate the Monthly Time Return and the feedback of many of the 2149s dealing with Miscellaneous work.

The '2149' - It will be possible, when the Weekly Time Card system is operating satisfactorily, to redesign the CAFC 2149. This is desirable for several reasons. In the first place, the trade spaces will be redundant; secondly, it was never designed for use as a form to be submitted quarterly and thirdly, it is not very easy to use as a punch card source document. This revision is at least 2 years away and when it comes it is hoped that the alterations will not be too drastic.

Revision of Equipment Maintenance Codes- It is felt that many of the equipments for which codes are provided are either obsolete or no longer need to be identified as a separate type. For example, certain World War 2 radio sets are still separately coded, though neither the Equipment Manager at CFHQ nor the workshop commander is really interested in how much work is being done on them. In cases like this, one EMC could replace perhaps a dozen which would save that much paperwork. Also, fleet managers at CFHQ find it difficult to identify particular fleets using EMCs because they are too general and yet ECCs are too detailed (e.g. There are more than 100 ECCs covering the $2\frac{1}{2}$ ton truck fleet though there are less than 5 major variations in basic model). Some revision of vehicle EMCs would obviously help.

New Output - It is a sad fact of life that the good people who provide the basic input data are the ones who derive least immediate benefit from the system. If it is any consolation, at least 12 new print-outs are scheduled for introduction during the next $2\frac{1}{2}$ years. A basic change in policy is involved here because these print-outs will not be produced on a routine basis but on demand. In the past, using computer print-outs has almost been an art in itself. In the first place the layouts used were often very complicated; secondly, a vast amount of information, much of it irrelevant, was dumped and had to be sorted through. Finally, the actual information required was very often a summary of a number of facts scattered through several reams of paper. What has been done is to find what the most frequent data needs are and then to arrange programs to produce just this data. The program can then be run when that information is needed. This kind of information service could be made available to workshop commanders and Command Headquarters in addition to directorates of CFHQ.

Two other basic points of philosophy may also be encouraging. In the first place changes to the reporting system will be made at infrequent intervals, perhaps once or twice a year. Secondly, publications that notify changes to the system will be issued well in advance of the change implementation date.

It is hoped that all those involved in the reporting system will respond to the efforts that are being made to make life easier for you by redoubling your efforts to reduce the number of errors made in recording the work you do. Remember - the end result of your work will be better equipment, better managed and, hopefully, the money saved will find its way into better pay.

CFHQ TECHNICAL NOTES

By Maj C.R.M. Fillingham REME

New Manual on Vehicle Servicing

One of the main problems in trying to service vehicles correctly is to find the right instructions. Different servicing intervals appear in different pamphlets, manuals and manufacturer's guides.

In the very near future a completely revised CF EME Manual, VEH A 123 Instr 1 (Issue 9) will be issued and will provide a comprehensive guide to vehicle servicing. This one instruction covers all types of vehicles and engineer equipment from the Sled, Self Propelled to the M113A1, and from the smallest pick-up to the largest snowblower. Details of servicing intervals and tasks will now be issued under a new range of manuals of the letter W series, within both the Vehicles and Engineer Equipment Sections. To find the servicing checklist of a vehicle it will only be necessary to know the manual reference of its data summary. Then substitute the letter "W" for the letter "Z", the number and instruction number will be the same. All new and recently issued vehicles will have a servicing checklist issued in this way. Older vehicles will have to be catered for by the local production of checklists, but this will only be a temporary requirement.

Some adjustments have been made to greasing and oil change intervals to up-date them in the light of improved lubricants and developments in engineering. A new monitoring procedure is also being introduced to ease the problem of scheduling vehicles for servicing. The form that has been devised can be used for any type of vehicle and provides a ready reference for the servicing record of any vehicle. Many units and bases are already operating locally devised systems such as this and they will find no great problem adjusting to the new procedure.

Those folks who have been careless about servicing will find the new manual a bit of a shock to their systems, but once familiar with it things will be a little easier and a lot more efficient.

Other Servicing Manuals Re-issued

A comprehensive survey of servicing manuals has also led to the rewrite of VEH A 124 - Lubricant Conversion Table and VEH A 153 - Unit/Base Servicing Procedure. The only real innovation, other than in terminology, is the requirement to regularly exercise vehicles that are not in preservation but are not being used regularly. Experience has shown that vehicles that are neglected in this way are a major source of trouble when they are suddenly required for use. If nothing else, this will encourage users to put vehicles into preservation and, as a further encouragement, the new preservative engine oil will not have to be drained when the vehicle is put back into service but may be used for 5000 miles.

Sicard Snowblowers

A number of large Sicard snowblowers may be re-engined with Rolls Royce Meteor engines by 202 Wksp Depot at Montreal. The existing Continental engine has had some reliability and spares problems. With the run-down of the Centurion fleet, the spares backing for the Meteor engine and the ready availability of rebuilt engines makes the re-engine program look attractive provided that the engineering problems are not too expensive.

Trucks SMP 2½ ton

"Brand new" 17 and 18 year old 2½ ton trucks will soon be appearing in unit hands to replace high mileage, high cost vehicles. This is part of a plan to make use of vehicles that have been in stock and never used. They are being refurbished prior to issue to eliminate the ravages of years of storage. Judging from tests carried out in 1968, they should make a useful contribution to reducing maintenance work loads on this fleet.

SUPERIOR BUS - ALTERNATOR FAILURE

By Captain G.A. Riley

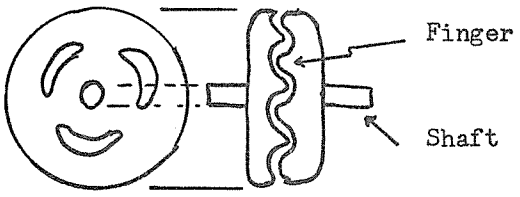
Base Land Maintenance, Edmonton, like most other workshops across the country have had their share of problems with failures on the Superior buses. These failures seem to come from nowhere, run their cycle for some unknown reason and having taken each bus in turn, are replaced with a new set of circumstances.

We thought that we had seen them all until this past summer, when a new virus overtook these buses and they came down with a malady that we had not experienced before. This time it involved the alternators and it ran through the Superior fleet like a flash epidemic.

Since the first occurrence of this failure was not as severe as those that followed, the cause was not immediately evident. The second failure, however, was much more drastic and suggested to our knowledgeable civilian electrician, Mr. Leo Bieganek, that the alternator rotor was operating at an unnecessarily high RPM -- much higher than was necessary to provide good generation at the required charging rate. Leo made some fast checks with a tachometer and confirmed his suspicions. The engine speed governor was not governing to the normal 3500 to 3600 RPM, but was permitting engine speeds up to and over 4000 RPM. Unfortunately, before he could apply his medicine, a third alternator caught the disease and it too was damaged.

To get down to some technical facts -- in addition to the lack of proper engine speed control, it was found that the pulley ratio, even at normal governed engine speed, was spinning the alternator rotor at about 10,800 RPM. This alternator should provide adequate output at about 6000 RPM at highway speed, which will allow for the reduction at idling speed.

The rotor in these alternators is made in two halves. Each half has 'fingers' that are interleaved (see sketch).



ROTOR

At high rotational speeds the fingers were being expanded by excessive centrifugal force and were coming in contact with the stator. The result? Quite frankly, all hell broke loose -- the rotor, stator, wiring, connectors and the rotor shafts were damaged.

Leo (Mr. Bieganek) took a tach reading off the engine damper pulley (9 inch) and another reading at the rotor pulley (3 inch) on a working unit. He found that the alternator was turning at a damaging 12,000 RPM (based on the incorrectly governed engine speed of 4000 RPM).

Once the problem was identified the solution was comparatively simple, as is so often the case. Leo arranged with our machinist, Mr. Kashton, to come up with a 4-inch pulley for the alternators and has now installed a 4-inch pulley on each of our Superior alternators. With the engine speed correctly governed to 3500/3600 RPM and the new 4-inch pulley on the alternator, the rotor speed is now a more reasonable 8000 RPM. Reducing RPM on all Superior alternators in this manner has had the desired effect on their working life. We have had no further failures since we converted all alternators to the 4-inch pulley and set the engine speed governors to correct operation.

Incidentally, if you don't already know, the cost of one of these alternators (retail) is about $200.00; or on the exchange basis, about $110.00, if you have anything left as an acceptable trade-in. If you add to this the cost of a regulator, in the vicinity of $70.00, it becomes a pretty costly repair. We consider this "modification" has saved this base hundreds of dollars to date in reduced labour, parts and down-time. If followed by others, it may also result in similar savings on their base.

A suggestion award has already been initiated for Mr. Biegnek for his initiative in coming up with the solution to this problem. We hope that his efforts and this little article will also save you from experiencing similar problems and VOR time in your location -- if you happen to be blessed with "old reliables" (Superiors???)

THE MILITIA PAGE

39 TECHNICAL SQUADRON

Major R.J. LaVigne, CD

39 Technical Squadron RCEME, located in Windsor, Ontario, can trace its history back to 1942; at which time the 2nd (R) Divisional Workshop (RCOC) was formed in that city. With the formation of the Corps of RCEME the squadron, as a RCEME formation, held its first official parade in the fall of 1944. Lieutenant-Colonel B.W. MacKeen, the first RCEME Commanding Officer of the unit (in 1944), has since been appointed the squadron's first Honourary Lieutenant -Colonel.

For a number of years 39 Technical Squadron has been able to maintain an effective strength of between 90 and 100 all ranks, as compared to the unit establishment of 83. Not only has this contributed in great measure to militia strength and achievements in the Windsor area, but it has also permitted the squadron to fill 100% of its commitments to Summer Camp and Mobile Command week-end exercises over the past three years.

In 1968, despite the fact that the unit was involved in a move to new quarters, 39 Technical Squadron was judged to be the most efficient RCEME Reserve Squadron in Canada and awarded the William Lennox Thompson Trophy for that year. As a further tribute to its importance in the community, the squadron and its history was recently the subject on an hour long program on the local CBC radio station in Windsor. The squadron maintains close liaison with several reserve USA units in Michigan and exchange visits are frequent.

The present Commanding Officer of 39 Technical Squadron RCEME, Major Robert J. LaVigne, CD, assumed command in 1967. Prior to that time he held the appointment of 2IC of the squadron for 3 years. His service with the Reserves also includes appointments with The Windsor Regiment (RCAC) and with the RCAF Reserve in both Hamilton and Windsor. From 1942 to 1947 Maj LaVigne served with the RCAF, both in Canada and the UK.

Major LaVigne's "8 to 5" employment is Traffic Manager for Hiram Walker and Sons Ltd., Walkerville, Ont.

Who's Where

LOCATION OF RCEME WARRANT OFFICERS

Lists of Other Ranks are controlled by MOC, not by corps, therefore it is very difficult to compile a list of RCEME Warrant Officers and hope to achieve 100% accuracy. Our thanks to CP Branch, CFHQ, for providing us with the following names and locations. For the few errors or omissions we may be found guilty of, we ask your indulgence.

CHIEF WARRANT OFFICER

B	Almey	CFHQ, LETE
NG	Barker	CFHQ
CH	Baynes	CFB Edmonton
DN	Campbell	CFB Kingston
JC	Coles	CFB Soest
JM	Cunningham	202 Wksp Dep, Montreal
RJ	Dand	CFHQ
TH	Dodds	CFSCLOE, Kingston
E	Doherty	202 Wksp Dep, Montreal
J	Dudley	CFHQ
WE	Elliot	CFB Chilliwack
RL	Evans	CFHQ, LETE
HG	Ferguson	CFB Kingston
HE	Foley	202 Wksp Dep, Montreal
GJ	Gall	CFHQ
N	Gavriloff	CFHQ
AG	George	202 Wksp Dep, Montreal
JJ	George	1 Svc Bn, Calgary
DE	Gill	CFHQ, LETE
ME	Guilfoyle	CFSCLOE, Kingston
JW	Hayes	CFB Rockcliffe
JE	Henry	CFB Shilo
JB	Hynes	3 Svc Bn, Gagetown
AF	Jackson	403 Hel Sqn, Petawawa
RL	Johnson	27 CFSMD, London
HL	Keech	CFHQ
MD	Kelly	CFB Calgary
GA	Knowles	I Staff, Toronto
JL	Landry	5 Svc Bn, Valcartier
W	Lasuta	HQ Marcom
KA	Lee	4 Svc Bn, Europe
JE	Little	CFHQ
LH	Lowry	CFB Rockcliffe
NE	Mahood	CFB Rivers
JG	Mallett	CFHQ
JC	McElroy	2 Svc Bn, Petawawa
DM	McInnes	CFB Winnipeg
PM	McGovern	CFHQ, LETE
WC	Myatt	CFS Clinton
GW	Rawling	CFHQ
JM	Ronan	CFHQ
DA	Ross	CFHQ, LETE
FA	Rutherford	CFHQ
J	Silzer	CFHQ
G	St Pierre	CFB Winnipeg
JD	Stever	CFHQ, LETE
J	Szumlanski	CFSCLOE, Kingston

CHIEF WARRANT OFFICER

AG	Thivierge	CFHQ
J	Thorne	1 Svc Bn, Calgary
TJ	Tinman	202 Wksp Dep, Montreal
JL	Trinca	2 Svc Bn, Petawawa
IS	Walsh	202 Wksp Dep, Montreal
RR	Wilson	LDSH(RC), Europe

MASTER WARRANT OFFICER

JA	Ablett	CFHQ
LW	Alexander	4 RCHA, Petawawa
EB	Allen	CFB Winnipeg
FT	Allen	CFSCLOE, Kingston
JT	Almdal	403 Hel Sqn, Petawawa
DE	Anderson	CFHQ
DA	Arnott	CFB Kingston
NL	Arscott	CFS Baldy Hughes
RP	Arsenault	8 CH, Petawawa
JW	Atkins	CFHQ
R	Aubuchon	5e RALC, Valcartier
CH	Babb	CFB Rockcliffe
TW	Barber	403 Hel Sqn, Petawawa
AC	Barker	3 Svc Bn, Gagetown
WB	Barnes	CFHQ
JP	Barnhart	2 PPCLI, Europe
EG	Beeson	202 Wksp Dep, Montreal
BW	Bennett	27 CFSMD, London
WA	Best	CFB Kingston
WL	Betcher	FGH, Calgary
RJ	Bezanson	CFB Rivers
FJ	Billinghurst	CFHQ
HC	Bingham	202 Wksp Dep, Montreal
DG	Birdsell	3 Svc Bn, Gagetown
JA	Bishop	27 CFSMD, London
HE	Blackmore	CFSCLOE, Kingston
R	Blais	CFB Montreal
JM	Blanchard	5 Svc Bn, Valcartier
EE	Blanchette	CFB Toronto
JI	Boudreau	CFSCLOE, Kingston
AE	Boutillier	202 Wksp Dep, Montreal
ET	Bovey	CFSCLOE, Kingston
JA	Bowles	CFB Rockcliffe
WH	Broadbent	202 Wksp Dep, Montreal
TF	Broomer	CFHQ
FR	Cameron	2 Svc Bn, Petawawa
RJ	Cameron	202 Wksp Dep, Montreal
AM	Campbell	2 Svc Bn, Petawawa

MASTER WARRANT OFFICER

MA	Campbell	CFSCLOE, Kingston
NB	Cannon	3 Svc Bn, Gagetown
AE	Carver	4 Svc Bn, Europe
AJ	Carr	4 Svc Bn, Europe
JP	Champagne	5e ET du C, Valcartier
JJ	Charbonneau	202 Wksp Dep, Montreal
TJ	Clark	LDSH(RC), Europe
WJ	Clark	450 Sqn, St Hubert
WF	Clinton	CFB Montreal
RT	Clooney	CFSCLOE, Kingston
DW	Colbridge	27 CFSMD, London
AR	Colson	CFB Borden
L	Cote	5 Svc Bn, Valcartier
JE	Couch	CADEE, Valcartier
JA	Crane	202 Wksp Dep, Montreal
WR	Currie	4 Svc Bn, Europe
G	Crawford	CFSCLOE, Kingston
JE	Cushing	5e RALC, Valcartier
C	Cyr	12e RBC, Valcartier
FA	Darton	CFB Montreal
RE	Daye	CFB Gimli
WE	Davis	CFHQ
JE	Dewson	202 Wksp Dep, Montreal
JB	Dillon	202 Wksp Dep, Montreal
EG	Doubleday	1 Svc Bn, Calgary
A	Doerksen	CFB Borden
JD	Downes	HQ Mobcom
LE	Driscoll	CFSCLOE, Kingston
RD	Dunham	4 Svc Bn, Europe
GE	Einarson	CFHQ
RE	Endall	RCD, Gagetown
JB	Eno	2 Cdn Gds, Petawawa
FA	Farnsworth	202 Wksp Dep, Montreal
EJ	Fitzgerald	4 Svc Bn, Europe
M	Frankovitch	CFB Toronto
N	Frenette	2 R22eR, Cyprus
JH	Fyke	CFB Borden
CA	Gattrell	202 Wksp Dep, Montreal
WM	Gayton	3 Svc Bn, Gagetown
RR	Gibson	CFSCLOE, Kingston
FC	Gordon	CFB Kingston
KD	Gork	3 Svc Bn, Gagetown
KJ	Gourlay	4 Svc Bn, Europe
ER	Green	CFSCLOE, Kingston
W	Greenshields	CFHQ
EJ	Gross	CFB Rockcliffe
JW	Grouette	3 R22eR, Valcartier
HG	Gumbley	CFHQ
DF	Haas	CFSCLOE, Kingston
DA	Hall	5 Svc Bn, Valcartier
AL	Harlow	RCD, Gagetown
HJ	Hasler	202 Wksp Dep, Montreal
RG	Haugen	3 Svc Bn, Gagetown
GR	Hein	CFSCLOE, Kingston
LF	Hill	CFHQ
TC	Hooper	CFB Winnipeg
PS	Hudson	CFSCLOE, Kingston
TF	Hudson	CFB Winnipeg

MASTER WARRANT OFFICER

GD	Humphries	CFB Calgary
RW	Jackson	4 Svc Bn, Europe
FW	Jermey	CFSCLOE, Kingston
WC	Kilfoyle	CFB Kingston
DF	Knight	CFSCLOE, Kingston
PJ	Koethe	1 Svc Bn, Calgary
HH	Krupp	2 RCR, Europe
J	Kutyik	CFB Esquimalt
FX	Lannan	1 Svc Bn, Calgary
DA	Laramie	Cdn AB Regt, Edmonton
A	Lascelles	CFHQ
WJ	Leach	CFB Chilliwack
LH	Lewis	202 Wksp Dep, Montreal
HL	Linge	1 Svc Bn, Calgary
F	Linzmayer	CFHQ, LETE
AE	Lockett	CFB Shilo
AH	Lovell	CFHQ
JA	MacDonald	1 QOR of C, Esquimalt
DW	MacDonald	CFB London
ER	MacNeill	3 Svc Bn, Gagetown
RE	Malmsten	CFB Moose Jaw
E	Mandeville	2 Svc Bn, Petawawa
FJ	McDowell	CFB Esquimalt
CB	McLean	CFB Halifax
G	McIntyre	CFB Shilo
HD	Measor	CFB Chilliwack
RL	Mercer	CFHQ
GL	Meisner	CFSCLOE, Kingston
AR	Miller	CFB Shearwater
WW	Monkman	2 Svc Bn, Petawawa
J	Moore	1 RHC, Gagetown
R	Morton	CFHQ
AC	Munday	HQ Trg Com
AS	Murphy	CADEE, Valcartier
WE	Murphy	3 Svc Bn, Gagetown
WJ	Nelson	CFB Halifax
FJ	Neeve	HQ ATC, Trenton
RJ	Nicol	4 Svc Bn, Europe
AR	Nolan	CFB Esquimalt
CL	O'Grady	I Staff, Halifax
MP	Patterson	CFB Toronto
MV	Patterson	CADEE, Valcartier
EW	Phillips	CFSCLOE, Kingston
LE	Phillips	CFB Edmonton
GR	Pilote	CFB Chilliwack
VR	Pomeroy	I Staff, Saskatoon
WR	Quinn	3 Svc Bn, Gagetown
KD	Rabey	CFHQ
FL	Reid	CFHQ
EA	Rice	CFB Halifax
FL	Rodd	CFHQ
RS	Sales	HQ Pac Reg
SE	Schell	202 Wksp Dep, Montreal
WD	Schussler	CFB Toronto
D	Sears	3 Svc Bn, Gagetown
JD	Serle	CDLS London
ND	Sheldon	4 Svc Bn, Europe
JH	Siefert	CFB Rivers

MASTER WARRANT OFFICER

GL	Slade	2 Svc Bn, Petawawa
EH	Squires	1 PPCLI, Calgary
PA	Steele	1 R22eR, Europe
DF	Steward	2 RHC, Gagetown
DA	St John	HQ Mobcom
ME	Stoney	CFSCLOE, Kingston
RG	Stooke	1 Svc Bn, Calgary
KM	Sturley	450 Sqn, St Hubert
JW	Summerfield	CFHQ
RH	Sutherland	LDSH(RC), Europe
	Svendsen	CFHQ
EL	Swann	2 Svc Bn, Petawawa
GD	Swedberg	1 Svc Bn, Calgary
LS	Tetlock	4 Svc Bn, Europe
AE	Thibaudeau	202 Wksp Dep, Montreal
GF	Thompson	202 Wksp Dep, Montreal
TA	Thompson	202 Wksp Dep, Montreal
EW	Trattles	AMDU, Trenton
CD	Vipond	5 Svc Bn, Valcartier
LH	Walker	1 Fd Sv Sup Grp, Calgary
JS	Wardle	1 Svc Bn, Calgary
RK	Watson	CFB Winnipeg
DS	Watson	4 Svc Bn, Europe
BH	Wendorf	3 Svc Bn, Gagetown
TD	White	202 Wksp Dep, Montreal
EB	Wild	CFB Calgary
RR	Wills	1 Svc Bn, Calgary
FL	Wilson	CFHQ
EG	Wright	202 Wksp Dep, Montreal
EF	Zdancewicz	1 Drone Tp, Shilo

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